FAA Safety BRIEFING

March/April 2012

Your source for general aviation news and information

STANDING DOWN FOR SAFETY

DON'T BE SURPRISED —*BE PREPARED*

Federal Aviation Administration

www.faa.gov/news/safety_briefing

The March/April 2012 issue of FAA Safety Briefing *focuses on the themes of the 3rd Annual FAA Safety Standdown: loss of control accidents, aeronautical decision making, and advanced preflight. Articles on each of these critical areas provide important insight, tips and resources for improving general aviation safety.*

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Raymond H. LaHood *Secretary of Transportation*
Michael Huerta *Acting Administrator*
Margaret Gilligan *Associate Administrator for Aviation Safety*
John M. Allen *Director, Flight Standards Service*
Mel O. Cintron *Manager, General Aviation and Commercial Division*
Susan Parson *Editor*
Tom Hoffmann *Editor*
James R. Williams *Assistant Editor / Photo Editor*
Emanuel Cruz *Assistant Copy Editor*
John Mitrione *Art Director*

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CONTACT INFORMATION

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Comments or questions should be directed to the staff by:

- E-mailing: SafetyBriefing@faa.gov
- Writing: Editor, *FAA Safety Briefing*, Federal Aviation Administration, AFS-805, 800 Independence Avenue, SW, Washington, DC 20591
- Calling: (202) 385-9600

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JOHN ALLEN
DIRECTOR, FLIGHT STANDARDS SERVICE

Wind Your Watch

Growing up in Kentucky, I was steeped in folksy homespun wisdom that has served me well in life. One especially useful saying is the reminder that "haste makes waste." It rarely pays to act in a hurry, and I can think of too many times when I had to re-learn that particular lesson. I can also remember too many times when, as an Air Force T-37 "Tweet" instructor pilot at Arizona's Williams Air Force Base (now Phoenix-Mesa Gateway Airport - KIWA), I watched undergraduate pilot training (UPT) candidates react in a rush and consequently experience loss of control inflight (LOC-I).

I'm sorry to say that LOC-I continues to bedevil today's pilots. And, as Rich Stowell and Janeen Kochan both note in their excellent contributions to this issue of *FAA Safety Briefing*, LOC-I can happen to anyone, regardless of total time and aviation experience. That's why we are dedicating both the March/April magazine and the FAASTeam's third annual Safety Standdown to raising awareness of LOC-I and — we hope — reducing the number of LOC-I events.

In my days as an instructor pilot, I taught several specific steps to help my student aviators "un-LOC" themselves from the trap of upset scenarios. Since we are declaring war on LOC-I, I offer those steps below in the form of my own aviation acronym: WARR.

W = Wind Your Watch

Even if you've never worn the kind of watch with the traditional (not digital!) clock face and a stem used to wind it every day, you can see where I'm going with this one. In my experience, there are very few aviation situations that require immediate action from the pilot. But there are a great many aviation situations where impulsive, overly-hasty actions squander the time and opportunity required for a considered and more appropriate response. If you have the time, take the time. Unless it is one of the truly rare immediate action situations, pause to figuratively if not literally wind your watch.

A = Assess the Situation

The physican's oath includes the admonition to first do no harm. That's a key part of the rationale for the immediate wind-your-watch pause previously described. Especially when it comes to upset scenarios, the first instinctive thing you think to do is almost always the absolutely wrong action for recovery. The pause also serves as a shock absorber, hoisting your intellect and (just as important) your emotions over the initial "this-can't-be-happening" disbelief. You are then equipped to turn your energy toward the more useful task of objectively assessing the situation. In an upset scenario, calmly assess your aircraft's attitude. Ask yourself questions. Mentally note the answers. Then move to the next step:

R = Respond Appropriately

Only now is it time to act. It takes thinking, training, and repetition to respond in a consistently appropriate way, and I encourage every pilot to consider upset prevention and recovery training (UPRT) with a qualified instructor. In general, your first step is to unload the wing, thus distancing yourself from the stall-spin scenario. Check and set power. Neutralize the rudder. Use flight controls to smoothly roll back to level flight. Recheck power and set attitude for a best-rate climb away from terrain and obstacles.

R = Reassess

No doubt you have heard and repeated the aviator's triad: aviate, navigate, and communicate. Getting the aircraft back under control—aviating—is always the top priority. Once you have "un-LOCed" yourself from the upset scenario trap, it's time to reassess your situation. Confirm that the aircraft is under positive control (aviate). Configure controls and power to keep it that way. Re-establish the desired or assigned direction of flight (navigate). Finally, as necessary, communicate your intentions or requirements for continued safe flight.

There is a lot more information on LOC-I in this issue of *FAA Safety Briefing*, and you will find more still at the FAASTeam's Safety Standdown events around the country. I encourage you to enlist in the war on LOC-I by investing the time to stop, listen, and learn. That way, you won't be surprised—you'll be prepared.

ATIS Aviation News Roundup

Going Paperless

The FAA's Office of Aerospace Medicine has announced that beginning October 1, 2012, pilots must use the FAA MedXpress website (https://medxpress.faa.gov) to complete an electronic application for an Airman Medical Certificate or Airman Medical and Student Pilot Certificate (FAA Form 8500-8). MedXpress first became available in the spring of 2007 to help begin the transition to a paperless process.

According to Dr. Fred Tilton, FAA's Federal Air Surgeon, the paper system "allows for too many errors, leads to storage problems, and creates security risks." Along with solving many of these problems, the electronic system would also allow the FAA opportunities to enhance the certification process. Planned enhancements include a tracking program that would let pilots and AMEs check the status of an application as well as a feature that automatically transfers unchanged information from previous applications, making future applications much quicker and easier to fill out.

See the MedXpress ad on page 6 for more information on how to use this service.

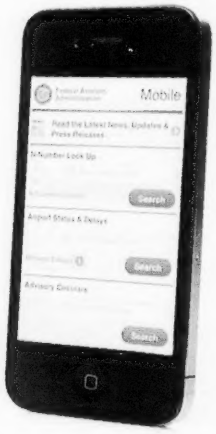
FAA Issues Corrections to Part 61

In a December 2011 ruling, the FAA clarified and corrected three items from an earlier 2009 rule regarding flight training certification (14 CFR part 61). The first amendment addresses a change to medical certification requirements found in 14 CFR section 61.23. With the revision, examiners need only a valid U.S. driver's license to conduct a test for a sport pilot certificate (in a light-sport aircraft other than glider or balloon).

Second was a clarification to instrument currency requirements. The new language states that a pilot who has failed to maintain instrument currency for more than six calendar months may not serve as pilot in command under IFR or in weather conditions less than VFR minimums until completing an instrument proficiency check. This was not a substantive change and was made only to amend confusing language. As was the case before this latest amendment, once a person's instrument currency lapses they have six calendar months in order to regain currency through the use of a safety pilot and/or with a simulator or training device. If a pilot fails to regain currency during this period, then they will need to have received a successful Instrument Proficiency Check (IPC) before serving as pilot in command under IFR or in weather conditions less than VFR.

The final change clarifies the FAA's original intent with regard to use of flight simulation training devices for training and testing when seeking to add a type rating to an existing pilot certificate or obtain a type rating concurrently with a pilot certificate. More specifics on these changes can be found at: www.federalregister.gov/articles/2011/12/16/2011-32333/pilot-flight-instructor-and-pilot-school-certification-technical-amendment

FAA Goes Mobile



Recently FAA deployed FAA Mobile, an easy-to-use mobile website that provides quick access to popular FAA.gov tasks for aviation enthusiasts on-the-go. You can look up N-numbers, find Advisory Circulars, browse airport delays, and more. You can find FAA Mobile at http://www.faa.gov/mobile. The FAA Mobile website allows you to stay connected with popular features of FAA.gov from any location—whether it be the hangar, the office, or home. You can also access the full web version of FAA.gov by tapping a link at the bottom of any FAA Mobile page.

FAA Mobile fully supports iOS 4 and higher, as well as Android 2.2 and higher. For details on all devices that are compatible with FAA Mobile, reference the About FAA Mobile 1.0 fact sheet at www.faa.gov/about/mobile/. Try out FAA Mobile today and tell us what other features you'd like to see added in the future.

Cessna Launches New Safety Initiative

Cessna Aircraft Company launched a new safety initiative in December 2011 to educate owners about new inspection procedures designed to help safeguard against corrosion and fatigue. The initiative affects 145,000 airplanes of the 100- and 200-series built between 1946 and 1986. The program stresses visual inspections for both corrosion and cracks caused by metal fatigue.

The revised inspection program has already been published in the airplane service manual for the 200-series, and will be published in April 2012 for the 100-series. According to a Cessna engineer, the program is primarily a "visual process aimed at supporting the continued airworthiness of aging airframes." The criteria for inspections will vary by model and aircraft age or hours of operation.

Cessna's website contains more details on the program along with links to a video and interactive presentation: www.cessna.com/NewReleases/FeaturedNews/NewReleaseNumber-1192361531220.html.

To learn more about aging GA aircraft, be sure to also read the article "Too Old to Fly" on page 25 of the Sep/Oct 2011 *FAA Safety Briefing* (www.faa.gov/news/safety_briefing/2011/media/SepOct2011TooOld.pdf).

Sun 'n Fun Quick Reference Booklet

If you plan on flying into the Sun'n Fun International Fly-In and Expo this year, make sure you read the 2012 Sun 'n Fun NOTAM first. It is available at www.faa.gov/air_traffic/publications/notices/. Then if you'd like something a little easier to handle in the cockpit for a quick reference, get yourself a copy of the pocket-sized Sun 'n Fun Quick Reference booklet.

SUN 'n FUN
BRAND
Spring Break For Pilots!
MARCH 27 TO APRIL 1 2012
QUICK REFERENCE BOOK
Information for Lakeland Linder and Surrounding Airports
FAASTeam Safety Stand Down—March 31
The Aviation Safety Year Starts Here

The booklet contains a page of all the frequencies for arrival and departure into Lakeland Linder Airport, plus information on several surrounding airports: Plant City Municipal, Bartow Municipal, Lake Wales Municipal, Winter Haven's Gilbert, Peter O. Knight, and Vandenberg. It also includes summary pages with altitudes for the holding patterns at Lake Parker and Lake Hancock, and diagrams for Lakeland Airport for planes, helicopters, light-sport and ultralight arrival/departures.

Copies of the Quick Reference booklet are available online for viewing and printing at www.FAASafety.gov, or by contacting Sun 'n Fun at (863) 644-2431.

FAA Announces AMOC for Cessna Seat Rail AD

On January 25, 2012, FAA released a Special Airworthiness Information Bulletin (SAIB) containing three Alternative Methods of Compliance (AMOC) for AD 2011-10-09 which deals with the seat rails on many Cessna aircraft including the popular 152, 172, and 182 models.

Since issuance of AD 2011-10-09, Cessna Aircraft Company has made available three AMOCs for those who must comply with AD 2011-10-09. Briefly, these AMOCs can be described as:

1. Repair procedures for steel seat foot/roller housings for Cessna Series 150 and 152 airplanes;
2. Relief for some operators from the required 100-hour repetitive seat track inspections; and
3. Roller housing inspections for the various Cessna models listed in AD 2011-10-09.

The FAA recommends you evaluate the actions of AD 2011-10-09 and the AMOCs referenced in this SAIB to determine what is best for you.

The FAA does not issue SAIBs on the availability of every AMOC. If an AMOC is reviewed and found to have information that is of significant importance to the aviation public, it may be communicated through an SAIB. The AMOCs in this case were communicated through an SAIB because of their potential efficient and cost-effective impact on safety while addressing the unsafe condition of AD 2011-10-09. For more information please see: http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgSAIB.nsf/(LookupSAIBs)/CE-12-14?OpenDocum(LookupSAIBs)/CE-12-14?OpenDocument

KIERAN K. O'FARRELL

Excitement Awaits in 2012 Safety Forums

We always strive to keep the FAA Safety Forums at Sun 'n Fun interesting, and these sessions have historically featured a star-studded cast of professional speakers on a wide range of safety-related subjects. Of the many highlights over the years, one of the more "interesting" and memorable sessions occurred last year, when an EF1 tornado hit the airfield around noon. John and Martha King were on stage when it went completely dark. Consummate professionals that they are, John and Martha never missed a beat—they finished their seminar illuminated by flashlights.

We don't plan to repeat *that* kind of excitement, but we *have* made changes to freshen up the forums and enhance the quality and consistency of our general aviation (GA) safety message. One tweak is to recruit some new speakers to focus more tightly on current accident trends in the always-dynamic aviation environment. Our 2012 speakers hail from a number of different agencies and industries, and the FAASTeam believes this diversity will result in the most exciting, innovative, and safety-focused schedule we have ever developed for this event. Another change is to increase the number of offerings—the 2012 event will feature five forums per day. With the addition of the Safety Standdown (*more on that below*) and a Town Hall meeting with Congressman Sam Graves (R-MO), that brings the total number of safety presentations to an unprecedented 27. A look at the schedule shows that we have also adjusted times, with each day's sessions now beginning at 9:00 am and concluding at 2:00 pm, just before launch of the daily air show.

Please join us at the FAASTeam's National Resource Safety Center or tune in via the Internet to a seminar that may change the way you look at your own flying skills and habits.

A Wealth of Topics

So what's on tap in terms of topics? We're excited to report that during Sun 'n Fun 2012, the FAASTeam National Resource Center will become one of the launch platforms for the NTSB's new GA Safety series, presented by NTSB and other experts. The program includes a session on human factors, air traffic control, and meteorology. A highly-experienced accident investigator will talk about accident investigations, which are an important tool in accident prevention. NTSB Board Member Earl Weener, an enthusiastic GA pilot and aircraft owner, will present a seminar called "Personal Flying: How Safe Do You Want to Be?"

And that's just the beginning! Other topics on this year's FAA Safety Forum schedule include intercept operations (NORAD), the roles of a CFI, technologically advanced aircraft, enhancements to the WINGS program, preflight errors, and situational awareness. The FAA's NextGen experts will fill you in on the "NextGen Air Transportation System and GA," and we'll hear from the Office of Runway Safety. Presenters from the AOPA Air Safety Institute will also be on hand to deliver some of their popular and highly acclaimed safety seminars.

In addition to pilot-related topics, there are a number of maintenance sessions for aviation maintenance technicians (AMTs) in areas such as failure to follow procedures and maintenance documentation.

For the first time ever, we will honor a few recipients of the FAA's most prestigious awards: The Wright Brothers Master Pilot Award, and The Charles Taylor Master Mechanic Awards on Friday, March 30th. The idea is to showcase the 50-plus years of excellence and dedication required to qualify for these awards.

FAASTeam Safety Standdown

Capping off the week will be the FAASTeam's third annual Safety Standdown on Saturday (31 March). The theme—"Don't be Surprised; Be Prepared"—focuses around preventing loss of control (LOC), the leading causal factor in fatal accidents. The Safety Standdown will look at LOC from three different angles: preflight mistakes, aeronautical decision making that leads to loss of control, and practical tips on what to do if you do find yourself in a LOC situation.

If you are planning to attend Sun 'n Fun, please come to the FAASTeam's National Resource Safety Center and join us, or tune in via the Internet to a seminar that may change the way you look at your own flying skills and habits.

All of these exciting seminars should be extremely dynamic and informative. So stay tuned, stay focused and participate in self education for safety.

Kieran K. O'Farrell is the FAASTeam National Resource Center Front Line Manager.

FAA Safety Forums

at the

38th Annual Sun 'N Fun International Fly-In & Expo®

	09:00 – 9:50	10:00 – 10:50	11:00 – 11:50	12:00 – 12:50	13:00 – 13:50
Tuesday, March 27	***"Avoiding Maneuvering Flight Accidents – The Human Factor"*** Evan Byrne, NTSB, Human Factors	***"Light Sport Aircraft"*** Scott Landorf, FAASTeam Program Manager	***"Say Again? Radio Communications Done Right"*** Cindy Carter, AOPA Air Safety Institute	***"Who Needs Upset Prevention and Recovery Training (UPRT)?"*** Janeen Kochan, Ph.D. FAASTeam Lead Representative	***"A Fatal Crash Course: The Top 10 Reasons We Lose Pilots"*** Tony James, FAA Office of Accident Investigation and Prevention
Wednesday, March 28	***"Making the Right Decisions"*** Kristi Dunks, NTSB, Senior Air Safety Investigator	***"Interceptor, Operations, TFRs and You"*** Lt. Col. Ray Bonita NORAD, Peterson AFB, CO	***"FAASAFETY.GOV/ Pilot Proficiency Program: Part 1"*** Bryan Neville, FAA Safety Team Outreach Manager	***"FAASAFETY.GOV/ Pilot Proficiency Program: Part 2"*** Bryan Neville, FAA Safety Team Outreach Manager	***"Failure to Follow Procedures"*** Barry Byrd, FAASTeam Program Manager
Thursday, March 29	***"Air Traffic Control: Trust But Verify"*** Scott Dunham, NTSB, Senior Air Traffic Control Investigator	***"NextGen Air Transportation System and GA"*** Gisele Mohler, FAA Director of NextGen Performance & Outreach	***"Teaching and Learning to Fly in High Performance Aircraft"*** K. Hackney, VP Platinum Aviation Holdings	***"The CFI Roles: Learning, Teaching and Evaluating"*** Diego Alfonso, FAA Operations Inspector Orlando FSDO	***"Use of Unmanned Aircraft"*** Alan Frazer, University of North Dakota
Friday, March 30	***"Be AWARE- The Science of Situational Awareness"*** Susan Parson, FAA Flight Standards Service	***"Wright Brothers Master Pilot Awards"*** Fred Kaiser, FAASTeam Program Manager	***"Charles Taylor Master Mechanic Awards"*** Fred Kaiser, FAASTeam Program Manager	***"Personal Flying: How Safe Do You Want to Be?"*** Earl F. Weener, PhD NTSB Board Member	***"Meet The FAA"*** Doug Murphy, FAA Southern Region Administrator
Saturday, March 31	**"Town Hall with Congressman Sam Graves (R – MO 6th District)"** U.S. House Transportation Subcommittee on Aviation **09:30 – 10:50**		***FAASTEAM SAFETY STANDDOWN 2012 "Loss of Control"*** FAASTeam Presenter	***FAASTEAM SAFETY STANDDOWN 2012 "Aeronautical Decision Making"*** FAASTeam Presenter	***FAASTEAM SAFETY STANDDOWN 2012 "Proper Preflight"*** FAASTeam Presenter
Sunday, April 1	***"Weather Wise"*** Paul Suffern & Don Eick, NTSB Meteorologists	***"Maintenance Documentation"*** Barry Byrd, FAASTeam Program Manager	***"The DNA of Airport Safety"*** Dan Cilli, FAA Office of Runway Safety	***"Flying in the FL Airspace"*** Dennis Whitley, FAASTeam Lead Representative	***"Going Beyond Preflight: Let's Take A Walk"*** Mark Laughridge, FAASTeam Program Manager

FAA Forum Open Daily at 8:30 a.m. and FAA Exhibit Hall Open Daily at 9:00 a.m.
Schedule is subject to change; for updates check WWW.FAASAFETY.GOV and WWW.SUN-N-FUN.ORG or scan the QR code.
Become a part of the FAA Safety Team, go to WWW.FAASAFETY.GOV.

Fast-track Your Medical Certificate

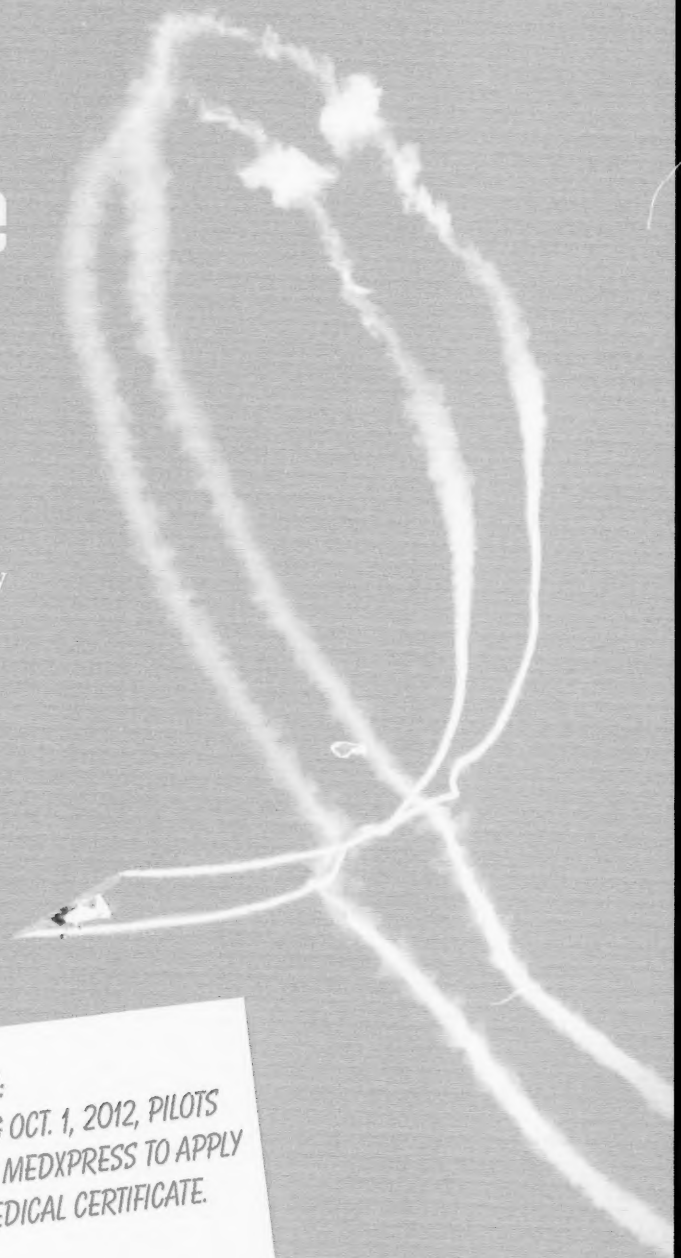
With FAA MedXPress, you can get your medical certificate faster than ever before.

Here's how: Before your appointment with your Aviation Medical Examiner (AME) simply go online to FAA MedXPress at https://medxpress.faa.gov/ and electronically complete FAA Form 8500-8. Information entered into MedXPress is immediately transmitted to the FAA and forwarded to your AME before your medical examination.

With this online option you can complete FAA Form 8500-8 in the privacy and comfort of your home and submit it before your appointment.

The service is free and can be found at:

https://medxpress.faa.gov/



ATTENTION:
BEGINNING OCT. 1, 2012, PILOTS MUST USE MEDXPRESS TO APPLY FOR A MEDICAL CERTIFICATE.

FREDERICK E. TILTON, M.D.
FEDERAL AIR SURGEON

Aeromedical Advisory

Sneezes and Zzzzs

As winter's grip on most of the country slowly loosens, the countryside comes back to life. While most people regard the warming weather as nothing but good news, not everyone is so cheery. For those who suffer from seasonal allergies, the annual spring rejuvenation can be a very unpleasant time.

To cope with the sneezing and congestion, many allergy sufferers turn to over-the-counter (OTC) medications like Benadryl®, Allergia-C®, and other common allergy remedies. Though effective, these medications are not without side effects. In fact, the active ingredient in most of these medications is the same: Diphenhydramine. Diphenhydramine is a great medication that can be used not only for allergies, but also to treat cold, cough, and even motion sickness. It can even be used to treat allergies in your dog (but check first with your vet for dosing and instructions). But it also has a function that can be especially troubling for those of us in aviation: it acts as a sedative. More on that in a moment.

The Cure Can Be Worse?

In weighing the use of any medication, you always have to consider whether the cure is worse than the symptoms. Because many, if not all, medications have side effects, it is important to consider those side effects in your decision to take a medication, especially an OTC medication where a doctor and pharmacist are not involved in the decision. In the case of diphenhydramine, side effects can include dry mouth, nose, and throat; drowsiness; dizziness; nausea; vomiting; loss of appetite; headache; muscle weakness; and nervousness.

While it's unlikely you will experience all of these side effects, even one or two can have a negative effect on your ability to fly safely. So if you find yourself in a situation where you feel the need to take an allergy medication, you need to seriously consider whether you should be flying at all. Remember that it is your responsibility as pilot in command to ensure that you meet all applicable medical standards before any flight. No one expects you to be as skilled as an aviation medical examiner in determining your exact medical status, but you know your body. Just as with any flight, the FAA expects you to be honest with yourself when it comes to assessing whether you are fit to operate an aircraft as pilot in command.

Would You Fly on Sleeping Pills?

Now back to diphenhydramine. The side effects are certainly a potential issue, but that's not all. In addition to being used in OTC allergy medications, diphenhydramine is an active ingredient in a number of sleep aid medications. These include Unisom®, Sominex®, and Nytol®. It is also a key ingredient in most, if not all, labeled medications with the "PM" notation, such as Excedrin PM® or Advil PM®. Most people probably wouldn't be aware that OTC medication taken for allergies is also widely used as a sedative. Another problem with diphenhydramine is that some people are not aware of its side effects. Individuals who have taken diphenhydramine often subjectively report that they feel "perfectly fine." However, performance tests show that these same people were just as incapacitated as others who were legally intoxicated from alcohol. Needless to say, this knowledge should lead you to the conclusion that it is not a good idea for you to perform flight crew duties while taking these medications.

If you feel the need to take an allergy medication, you need to seriously consider whether you should be flying at all.

This discussion also highlights the larger issue for pilots: Our standards must be higher. We have to take a much greater interest in our medications, whether OTC or prescription, for how they could affect piloting ability. If you're not sure, ask your AME. Better still, when in doubt, sit it out. Remember that flying is supposed to be fun ... and you'll have a much better, and much safer, flight when you are fit and free of potentially harmful medications.

Frederick E. Tilton, M.D., M.P.H., received both an M.S. and an M.D. degree from the University of New Mexico and an M.P.H. from the University of Texas. During a 26-year career with the U.S. Air Force, Dr. Tilton logged more than 4,000 hours as a command pilot and senior flight surgeon flying a variety of aircraft. He currently flies the Cessna Citation 560 XL.

U.S. Department of Transportation
Federal Aviation Administration
Report Wildlife Strikes
http://wildlife.faa.gov
http://www.faa.gov/wireless
USDA
QR Code Scanner for Smart Phone Users

Ask Medical Certification

Q: In 2004, I had an exercise EKG for a UK Civil Aviation Authority first-class medical and an anomaly was found with the reading. I went to our local hospital for a follow-up examination and was found to have a narrowing of my left descending atrium. A stent was installed in 2004 and I now take one 2.5 mg Bisoprolol tablet per day. I had no indications of any heart problem before, and I have had none since. I have also recently been diagnosed with type 2 diabetes mellitus and am taking one 500mg Metformin tablet per day. I haven't flown since 2004 and I wish to renew my second- or third-class medical, in order to exercise privileges as a flight instructor. Is this possible?

A: Yes it is. The requirements for full second-class privileges are different than those of third-class or private pilot. This is especially true for the stent insertion. All airmen who request second-class medical certification for this procedure must provide the FAA with a maximal nuclear stress test performed according to the Bruce Protocol [your cardiologist or internist will be familiar with this], and a undergo a coronary angiogram. Here are the URL addresses for the sites that provide specifications for both the coronary artery disease and the diabetes mellitus treated with oral medications:

www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/dec_cons/disease_prot/coronary/a/

www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/dec_cons/disease_prot/coronary/b/

www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/dec_cons/disease_prot/diabetes_med/

Q: I am a 49-year-old male single engine VFR pilot who recently just purchased a *Skyhawk* for our small flying club. At the age of 43, I had a minor heart attack that required two stents. I fly now with a special issuance that must be updated annually, but I'd also like to teach. My health is excellent according to my cardiologist, and I exercise and take my medications religiously. Is getting a CFI for me possible?

A: Yes sir, it is very possible. Since treated coronary artery disease is one of the FAA's specifically disqualifying medical conditions, you must demonstrate to the Federal Air Surgeon that you are safe to fly. You will need to provide us with all of the medical records from the heart attack and the stent insertion, plus undergo the testing that you can locate with the first two URL addresses in the previous question. The Federal Air Surgeon's Cardiology Consultant Panel must review the cases of ALL airmen who request first or second-class medical certification. This is a panel of cardiologists familiar with aviation medicine who will review your case when it is ready, and make a recommendation whether to grant you a waiver. If you are granted a waiver, known in the FAA as an Authorization for Special Issuance, you will need to provide the FAA with evaluation and testing at least once a year in order to maintain your certification.

Send your question to SafetyBriefing@faa.gov. We'll forward it to the Aerospace Medical Certification Division without your name and publish the answer in an upcoming issue.

Q: Why does my thyroid disorder (hypothyroidism) require me to have a special issuance?

A: The regulations—specifically, 14 CFR 67.401—state that an airman must demonstrate that he or she is safe to fly for the time period of the medical certificate. In a special issuance, the airman must provide evaluations or medical tests to demonstrate that to the Federal Air Surgeon, and then re-demonstrate that fact on a recurring basis. Hypothyroidism, or low thyroid levels, can cause effects on the human body that could adversely impact one's ability to fly safely. This condition can cause weakness, severe depression, memory loss, heart failure and cardiac arrhythmias. For these reasons, it is important for the FAA to have regular data showing that the airman is not hypothyroid, and is "euthyroid," as your physician will call it.

Photo by Tom Hoffmann

RICH STOWELL, MCFI-A

Pilot-in-*Control*

Avoiding Loss of Control Accidents

It can happen to anyone. Although the final report is still in development, data from the "black boxes" recovered from the 2009 crash of Air France flight 447 strongly points to loss of control-inflight (LOC-I) as the cause of this tragic accident. And, sadly, LOC-I accidents do occur on a much-too-frequent basis, especially in general aviation (GA). According to a recent Accident Data Set prepared by the General Aviation Joint Steering Committee (GAJSC), LOC-I was the dominant cause of fatal general aviation accidents over the last decade.

When we talk about loss of control, we are referring to accidents resulting from situations in which the pilot should have either maintained or regained control of the aircraft, but did not. Loss of control is divided into two types: Loss of Control-Ground (LOC-G), and Loss of Control-Inflight (LOC-I).

Forty percent of the fatal accidents during the period 2001-2010 were categorized as LOC-I, outpacing the number two fatal accident category, Controlled Flight Into Terrain (CFIT), by a three-to-one margin. LOC-I events were further subdivided into twelve phases of flight. As shown in Figure 1, most fatal LOC-I accidents happened during the maneuvering phase, occurring about 1.4 times as often as accidents during the approach and en route phases, and 26 times more frequently than accidents during both emergency landing phases combined.

The GAJSC data regarding maneuvering flight in particular are consistent with findings published by the AOPA Air Safety Institute where nearly 27 percent of all fatal accidents occurred during maneuvering flight. Moreover, 41 percent of those fatal accidents ended with a stall/spin. Realize, too, that for each LOC-I accident we can readily analyze, a significantly greater number of related and mostly uncounted incidents and hazards have also transpired. The goal, then, is to reduce not only the number of LOC-I accidents, but also the much larger group of near-accidents.

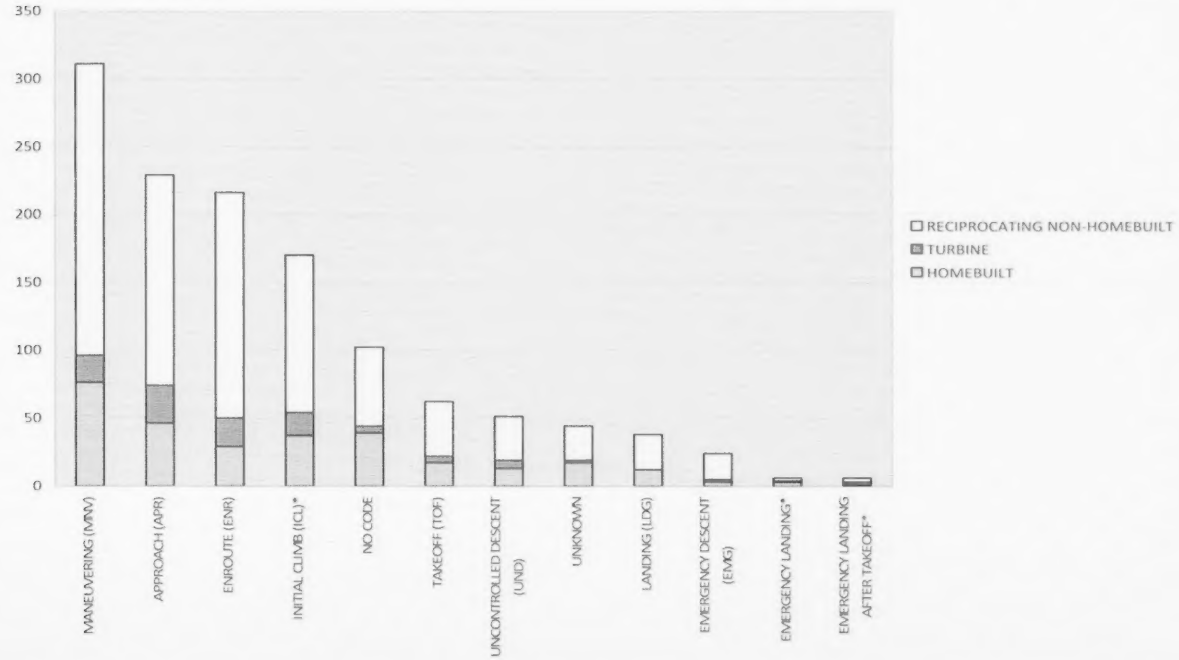
Unlike the wings-level, one-G stalls practiced for check rides, most inadvertent stalls are of the less benign, accelerated variety.

The obvious takeaway is this: We need to get better at maneuvering our aircraft. And "we" means each and every one of us. LOC-I does not discriminate. LOC-I happens to low-time and high-time pilots, to student pilots and airline transport pilots alike. Many factors can drive an LOC-I event: inadequate preflight, poor decision-making, faulty risk management, inexperience, complacency, distraction, surprise. But the final act in the accident sequence usually comes down to a misapplication of the controls by the pilot.

Don't Be Surprised

We can and should build a multi-layered defense against LOC-I through better training in the mental skills needed to avoid LOC-I in the first place, coupled with better training in the stick-

Fig.1 Loss of Control – Inflight (LOC-I) Events by Flight Phase 2001- 2010



and-rudder skills needed to prevent and recover from LOC-I scenarios. For example, too few pilots consider what they would or could do to fly an aircraft that has jammed controls. Slips and slipping turns are the necessary piloting skills to counteract stuck ailerons, a stuck rudder, and split flaps. Be aware that practicing such techniques should be accomplished during training sessions with sufficient altitude and preferably with an instructor who is comfortable with the subject of cross-controlled stalls. The same might apply during an asymmetric thrust event in a twin-engine aircraft as well. Many pilots are also unaware that, in the event the elevator control somehow becomes disconnected, certificated aircraft are required to be controllable through landing by using only trim and power adjustments. Of course, it takes training with a qualified instructor to be able to fly, much less land an aircraft without using its primary pitch control.

Build a multi-layered defense against LOC-I through better training in the mental skills needed to avoid LOC-I, coupled with better training in the stick-and-rudder skills needed to prevent and recover from LOC-I scenarios.

Stalls and spins continue to be a significant part of LOC-I. Unlike the wings-level, one-G stalls practiced for check rides, most inadvertent stalls are of the less benign, accelerated variety. Indeed, one study found that turning and/or climbing flight preceded 85 percent of fatal stall-only accidents; in other words, while the pilots were maneuvering. Another study found that 93 percent of accidental spins began at or below traffic pattern altitude. Maneuvering in the traffic pattern demands keen stall and spin awareness skills at all times.

During any unexpected or unusual event, it is important (if not cliché) to "fly the airplane" no matter what. This begins by immediately regaining control of the aircraft; or if control has not been lost, by not taking subsequent actions that could cause a loss of control. We can only bring the appropriate flying skills to bear, however, if we maintain control over ourselves first. Our rational brains must override the emotions and natural instincts that are often counterproductive to surviving an inflight emergency. We must be able to work our way through emergency situations by thinking and acting purposefully. This can only be accomplished through repeated and controlled exposure to scenario-based training exercises.

With the airplane under control, avoid becoming absorbed with what is wrong to the exclusion of the bigger picture. Maintain your situational awareness and take inventory of what is going right and what resources are available to you. For example, can you hold altitude? How much fuel remains? Is an airport or suitable off-airport landing site nearby? Whom can you enlist to help: passengers, ATC? And don't let the natural urge to get the aircraft back on the ground ASAP drive subsequent actions. Taking a few deep breaths and some time to think can bring greater clarity to an otherwise tense situation and just might reveal better options as you formulate a plan.

Top Three Tips on LOC-I

We asked Rich to provide three key points pilots should remember about loss of control. Here's what he said:

1. Prevent with the PAVE checklist: Awareness and prevention of conditions that could lead to LOC-I are by far the best strategies; LOC-I typically occurs at low altitude, so relying on the ability to recover to the exclusion of awareness and prevention often proves problematic. PAVE = Pilot, Aircraft, EnVironment, and External Pressures.

2. Heed the Warnings: LOC-I rarely occurs in a vacuum. Recurrent, scenario-based training not only highlights the warning signs that often precede loss of control events, but also reinforces appropriate mitigation strategies.

3. Learn to Recover: LOC-I recovery actions tend to be contrary to our natural instincts; appropriate recovery responses must be learned well, and because these skills are perishable, they must be rehearsed and/or relearned periodically.

Be Prepared

To reduce the threat of LOC-I resulting from mishandling the controls:

- Keep your mental and physical skills sharp.
- Review and rehearse emergency procedures often.
- Participate in the FAA WINGS and other safety programs.
- Treat the Flight Review not as a biennial chore, but as a great opportunity to learn something new, or to simulate accident scenarios and polish rusty skills.

GUIDELINES FOR PILOTS SEEKING ALL-ATTITUDE TRAINING

The following is intended as a general guide only. The layout is similar to that of an Advisory Circular.

HOW TO EVALUATE SPIN, EMERGENCY MANEUVER, UPSET RECOVERY, LOSS OF CONTROL, AND AEROBATIC TRAINING PROGRAMS

1. Purpose. This information is primarily for pilots who are interested in receiving training in spins, emergency maneuvers, upset recoveries, loss of control, and aerobatics (collectively, all-attitude training). It also provides guidance to those who provide such training. Since most all-attitude training is typically conducted in aircraft approved for acrobatic flight, relevant regulations and airworthiness standards are reviewed as well.

2. Related Reading Material. The following documents are available online at http://www.faa.gov:

horizon; the definition of aerobatic flight, however, does not specify pitch attitude or bank angle. The 30/60 rule, which appears in FAR 91.307 (c), specifies the conditions under which parachutes must be worn by occupants of an aircraft. In the classical sense, the term *aerobatics* includes spinning, looping, and rolling an aircraft through 360 degrees of yaw, pitch, and roll.

AFM/POH. Refers to the approved Airplane Flight Manual or Pilot Operating Handbook.

FAA, FAASTeam. Federal Aviation Administration, FAA Safety Team.

FAR. In an aviation context, the Code of Federal Regulations (specifically 14 CFR Parts 61 and 91) is more commonly ref
Aviation Regu

equally imprudent to attempt spin training in an aircraft in which intentional spins are not approved, or with an instructor who has minimal experience spinning a particular model.

Since regulations tend to allow considerable latitude in the case of all-attitude instruction, the aviation consumer—you—must apply your own set of standards in your quest to find quality training. Although these guidelines do not guarantee competent, safe instruction, they should equip you with some of the information needed to assess the services offered by various operators and make an informed decision.

6. Evaluating The School. Finding a good school is where the process begins. An excellent starting point is
lishes an
schools...

Guidelines for All-Attitude Training

For those interested in pursuing hands-on training in loss of control scenarios, Rich has prepared a document entitled, *Guidelines for Pilots Seeking All-Attitude Training*. The document is available for download from the SAFE website at http://www.SafePilots.org/documents/Guidelines for All Attitude Training.pdf.

- Consider enrolling in a spin, emergency maneuver, or upset prevention and recovery training course at some point in your flying career as well.

Note, however, that even though this training typically involves the use of aircraft approved for aerobatic flight, it is not traditional aerobatic training. It is one thing to learn how to perform intentional loops, rolls and other maneuvers with precision, but quite another to develop an awareness of situations that can lead to LOC-I and to learn the altogether different skills needed to recover from unexpected departures from controlled flight. Equally important, quality unusual attitude training creates a unique environment in which to learn how to override the potentially debilitating mental inertia that accompanies the normal shock of an unexpected loss of control.

The context in which unusual attitude training is provided is also critical. For it to be effective, unusual attitude training must be done in the context of typical accident scenarios; otherwise, the training will lack relevance and will prove of little practical value for loss of control prevention and recovery.

Common LOC training scenarios include stalls and spins, especially as they relate to maneuvering flight. For instance, consider scenarios such as the skidding base-to-final turn or the mishandled turnback to the runway following an engine failure soon after takeoff. Other training scenarios may include wake turbulence and other environmentally induced rolling upsets, spirals under the hood, and alternative ways of controlling an aircraft should any of the primary or secondary controls become inoperative.

Ultimately, applying the triad of good preflight habits, solid aeronautical decision-making, and sharp piloting skills on every flight will increase your margin of safety against a near-accident or accident attributable to an inflight loss of control.

Rich Stowell is serving as a subject matter expert during the 2012 FAA Safety Standdown. He is an internationally-recognized authority on loss of control prevention and recovery. A seven-time Master Instructor and charter member of the Society of Aviation and Flight Educators (SAFE), Stowell has been providing unusual attitude training for twenty-five years, including performing more than 32,400 spins. He is also the 2006 National Flight Instructor of the Year.

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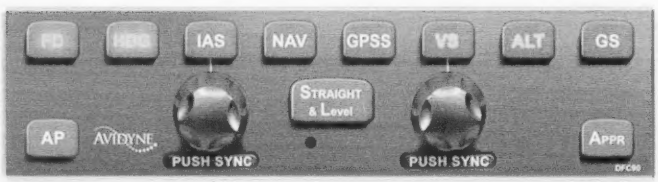
WES RYAN

THE ENVELOPE, PLEASE!

Smart Autopilots to Improve GA Safety

The FAA and industry are constantly working together to enhance safety for general aviation (GA) aircraft. Several new "smart" autopilots that leverage the attitude sensors in existing glass displays in GA aircraft are helping to achieve that goal.

Early studies of GA safety under the AGATE (Advanced General Aviation Transport Experiments) concluded that pilots needed better information in the cockpit to enhance safety. The revitalization of GA and the glass display revolution over the past 10 years have provided weather, terrain, traffic, and other information to reduce GA accidents and enhance pilot awareness. Ironically, even with all this great technology coming into small aircraft, loss of control accidents continue to cause fatalities. So the next big thing is to make airplanes easier to fly. Smart autopilots can help keep pilots from ever getting into bad situations, such as extreme attitudes where loss of control can occur, or from getting too fast or too slow.



Courtesy of Avidyne

Smart Systems

Enter the smart autopilots like the Avidyne DFC-90 and the Garmin GFC700 with electronic stability and protection (ESP). These devices bring features into small aircraft that have traditionally been available only in complex fly-by-wire flight controls in large commercial transports, or in very expensive military fighters. The difference is that these systems are simply meant to help the pilot stay out of trouble in the first place. They act like an instructor pilot, and assist with limiting the aircraft to a smaller portion of the existing certified envelope. Using attitude data from the installed AHRS (Attitude Heading Reference System) common to the new glass displays, they monitor bank angle, pitch attitude, and speed limits enforced by the existing autopilot. Some even use smart servos to provide a force gradient into the controls, a feature designed to coax the pilot back to a wings-level or level flight attitude, just as a flight instructor might do.

These systems still allow the same maneuverability in an emergency, and maximum performance in pitch all the way to stall, if the pilot needs it. However, they help the pilot stay away from potentially dangerous situations by enhancing stability and by giving the airplane a self-righting tendency when the controls are released. These systems are designed to help the pilot keep the aircraft in a safe, stable flight condition, and to prevent stalls/spins, over-speed, spirals, or other loss-of-control conditions if the pilot becomes disoriented, distracted, or incapacitated.

Certification Challenges

The challenge for certification of these systems was to overcome the traditional thinking associated with certification of complex fly-by-wire systems. In large aircraft, fly-by-wire is typically considered a critical system that cannot be allowed to fail. This consideration drives the cost of certification and the complexity of the system to a point where the technology would not be affordable to GA. In contrast, GA autopilots are typically treated as non-required equipment. So, as long as they can't hurt the airplane, their certification requirements are less stringent than complex flight controls for commercial transports. In GA, the FAA focuses on their ability to track an intended flight path without causing any hazard to the airplane or hazardous deviations from controlled flight. To remain consistent with this philosophy, recently certified smart autopilots like the ones mentioned earlier are designed so if the system fails, the airplane simply goes back to behaving in the same manner pilots are accustomed to when hand flying, with the same stall speeds and capabilities available.

A little protection never hurts, and the FAA is excited about the potential this new twist on an old idea provides for enhancing safety. New sensor and servo technologies make it all possible. We continue to look at ways to allow better automation to improve the way we fly, facilitating more personalized use of aviation. Smart autopilots are just the beginning, and technology is coming from the unmanned aircraft industry that will continue to provide safety enhancements, challenge traditional certification processes, and improve automation in GA. Stay tuned!

Wes Ryan is the Manager of the Aircraft Certification Service's Programs & Procedures Branch.

JANEEN ADRION KOCHAN, PH.D.

Keeping an UPRIGHT Attitude

Aviation in itself is not inherently dangerous. But to an even greater degree than the sea, it is terribly unforgiving of any carelessness, incapacity or neglect.

— Captain A. G. Lamplugh, British Aviation Insurance Group

We all love and enjoy aviation, right? So you might be surprised, or even ready to argue, when I say that it pays to be a pessimist in this particular activity. Now that doesn't mean that you have to adopt a grim-faced gloom-and-doom outlook. But, as I hope you learned the very first time you preflighted an aircraft, a healthy sense of "it-*could*-happen-to-me" skepticism goes a long way toward keeping you, your passengers, and your aircraft healthy and whole.

As Rich Stowell suggests in his Pilot-in-*Control* article on page 10, nowhere is that "it-*could*-happen-to-me" outlook more important than in our fight against the leading aviation accident hazard: loss of control—in-flight (LOC-I). Loss of control accidents have been on the constant increase for all categories of flight for the past 25 years. And, if the accidents are on the rise, the number of LOC incidents and unreported events are, no doubt, exponentially higher. That's why countering LOC-I is a focus area for the FAA's 2012 Safety Standdown. No matter how LOC is technically defined or accounted for in accident statistics, the fact remains that pilots—and that means *all* pilots—need to focus harder on staying in control.

UPRT Keeps You Upright

So, how do you pursue staying in control and improve your margin of safety in flying? One answer lies in Upset Prevention and Recovery Training (UPRT)—and if the abbreviation seems like too much of a mouthful, try thinking of it as "UPRight" training.

As with many kinds of aviation training, UPRT requires a variety of skills. The obvious one is physical skill, also known as stick-and-rudder skill. There is no substitute for hands-on practice for knowing how to recover and regain control of your aircraft.

But knowledge and attitudes are important as well. As another aviation cliché so deftly explains, a superior pilot uses superior knowledge to avoid situations that require the use of superior skill. Accordingly, another goal of UPRT is to teach you to maintain awareness of situations that could contribute to LOC and avoid putting yourself in LOC-inducing situations.

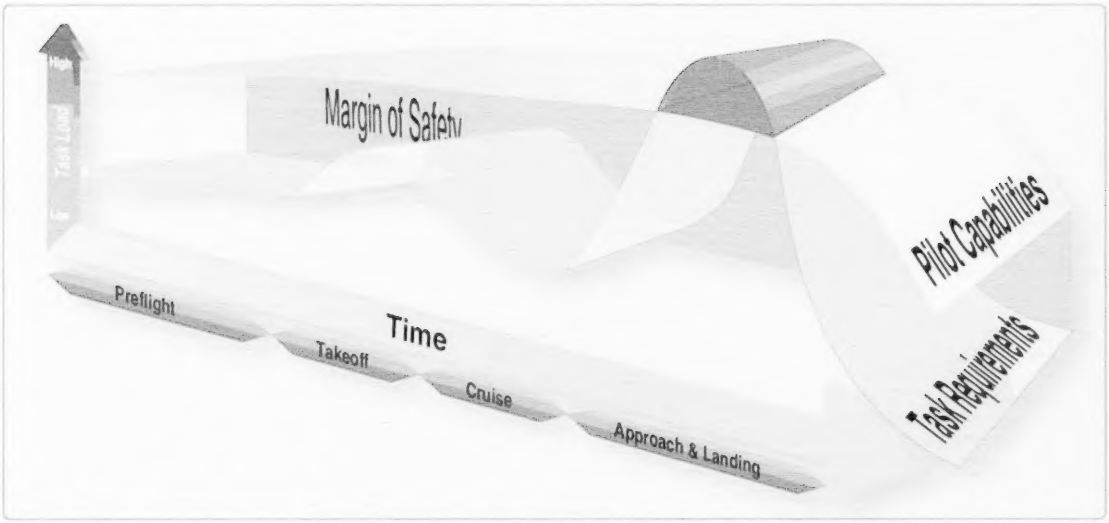
When it comes to awareness, one very important data point is the fact that the margin of safety changes many times throughout a flight. During approach and landing, for example, your task requirements (locating the airport, preparing for an approach to the runway, completing checklists, securing the cabin, etc.) can be significantly greater than the capabilities available to you at the time. Now add the fatigue factor common to the conclusion of any flight, and especially one that was long or replete with weather challenges. This combination of events is precisely how too much workload combined with distractions or other unexpected events (last minute runway change, a go-around, gusty winds, etc.) can lead to LOC.

Research shows that LOC accident pilots often missed, or even ignored, readily available clues and cues that could have prevented the upset or LOC event.

So, with the goal of increasing your margin of safety in mind, let's see how you can develop some of the UP—upset prevention—knowledge, attitudes, and mental habits that will help you avoid LOC.

Clues and Cues

In most accidents or unwanted outcomes, hindsight often reveals a multitude of factors leading up to a potential upset situation. Research shows that pilots often missed, or even ignored, readily available clues and cues that could have prevented



The area in red shows how a pilot's capabilities may be overwhelmed by task demand and reduce his/her margin of safety.

an upset or LOC event. These include such items as icing conditions, flight control malfunctions and wake turbulence. Ultimately, inattention to such clues and cues can lead to inadvertent or deliberate pilot-induced upsets.

The good news is that there are some very practical and straightforward cognitive (thinking) techniques that, if developed into solid mental habits, can help you pay closer attention and more accurately perceive information that could be a precursor to an inflight upset. Human factors scientists who study pilot decision-making have developed a number of models over the years. You may already be familiar with the DECIDE model, an acronym designed to guide the pilot through a series of structured steps you can use to avoid LOC-I. For example:

Detect that a change has occurred (*e.g., aircraft has departed straight-and-level flight*).
Estimate the need to counter or react (*e.g., need to lower pitch and increase airspeed*).
Choose a desirable outcome (*e.g., return to straight-and-level flight*).
Identify actions to control change (*e.g., pitch down, increase power*).
Do the necessary action (*e.g., execute the actions identified in previous step*).
Evaluate the effect of the action (*e.g., confirm resumption of straight-and-level flight*).

For those who find the DECIDE model too lengthy or complex, the FAASTeam has developed a simplified tool: the Perceive, Process, Perform (3P) model. Here's how it works.

Perceive: In order to avoid or mitigate risk factors, you must consciously seek out the clues and cues providing information about yourself and your surroundings. A structured way to perceive is to use the PAVE model to identify hazards associated with the pilot, aircraft, environment, and external pressures. You may have encountered PAVE as a preflight tool, but perceiving clues, cues, and hazards is an ongoing process. Ask yourself: "What am I paying attention to? What am I thinking about? Is my focus where it should be at this point?" Consciously monitor the engine parameters to seek information on the status of your aircraft systems. Look outside for weather, traffic, and UFOs (just seeing if you are paying attention). Though it sounds simple enough, pilots sometimes fail to perceive clues and cues effectively because paying attention takes mental effort and energy. Did you know that actively thinking burns more calories than just watching a video?

Process—Now that you have gathered information about the pilot, the aircraft, the environment, and external pressures, you need to process it. Ask yourself: "How am I doing? How is the aircraft performing? Is the weather as expected? Is there anything that needs to be acted upon? How will the situation be in the future?" And yes, the act of thinking to evaluate and process information also takes mental effort and energy.

Perform—Depending on the outcome of your processing, you may or may not need to act. If all is well, go back to step one and perceive.

Mental Muscle Matters

Now, let's look at an example of how the mental muscle you develop through habitual use of the 3P

model can help you avoid LOC-I. Imagine that you are flying a typical four-place GA airplane. You are approaching your destination airport and preparing for the landing. The controller tells you that you will be following a Boeing 737.

You continue to perceive, looking for the B-737 traffic while you complete your approach and landing checklists. You know from training and experience about wake turbulence, and you consciously bring that knowledge into processing the information ATC has provided about the B-737 traffic. Knowing how quickly a wake turbulence encounter can induce LOC, and how dangerous LOC would be this close to the ground, you determinedly scan until you spot the traffic at your 11 o'clock position. You tell the controller you have both the B-737 and the airport in sight, and acknowledge being cleared to land, number two behind the Boeing. You make a special mental note of the controller's standard "caution wake turbulence" admonition. You further process by reviewing wake turbulence avoidance procedures when winds are calm, as they are on final today.

Now it's time to perform. The B-737 is ahead, just below your altitude and descending. Although your normal procedure is to begin your own descent, you know you need to stay above the B-737 to avoid encountering its wake. With the long runway ahead of you, though, you recognize that you will have plenty of room to remain above the B-737, land "long" (i.e., beyond the larger aircraft's touchdown point), and decelerate with room to spare. You carefully maneuver your aircraft in accordance with what you have perceived and processed, and you land without incident.

Imagine, though, what might have happened had you not used your mental muscle. Let's say that you fail to spot the traffic right away, but you acknowledge landing clearance and continue inbound. You finally spot the B-737—wow, it's closer than you realized. You tell the controller you have traffic in sight and set about with your normal approach and landing configuration and routine. You turn final at 1,000 feet AGL. Your aircraft suddenly rolls a full 90 degrees to the left. Startled, you use your physical muscle—all of it—to wrestle the aircraft back toward level flight... descending all the while. You land (probably not one to brag about) and, still shaking from the near-disastrous LOC, taxi to parking.

Whether you performed correctly or (as teachers like to say) with "areas for improvement," there is a final and important step:

Evaluate—What were you thinking? Where did your decision-making process work, and where did it break down? What will you do differently next time? Using the B-737 example, perhaps you could request a turn for more spacing behind a large airplane. Or you could decide to go around and completely avoid the turbulence threat.

The most important thing is to think it through, either way: a good outcome might be the result of good thinking, but it could also be just lucky—and luck has a way of running out at very inconvenient times. We can have knowledge and perceptions, but fail to process information. We can process information (correctly or incorrectly) and fail to perform, or perform incorrectly. We can evaluate our performance incorrectly and never decrease the probability of having a bad outcome and fail to increase our margin of safety. It is this breakdown in our decision-making that contributes to LOC events, incidents and, unfortunately for some, fatal accidents.

Upset Prevention and Recovery Training (UPRT) can teach awareness and avoidance of situations that contribute to loss of control-inflight.

Stay UPRighT, stay safe, and stay alive!

Janeen Adrion Kochan holds a Ph.D. in Applied Experimental and Human Factors Psychology and an M.S. in Industrial and Systems Engineering. She has been involved in human factors research in medicine and aviation since 1980. A former Boeing 767 captain and CRM instructor for a major U.S. air carrier, Dr. Kochan now flies as a corporate pilot. She also holds A&P/IA, CFI, and DPE privileges.

Learn More

Special Airworthiness Information Bulletin CE-11-17 on Design Maneuvering Speed
http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgSAIB.nsf/dc7bd4f27e5f107486257221005f069d/3c00e5aa64a2827e8625781c00744393/$FILE/CE-11-17.pdf

Advisory Circular 61-67C Stall and Spin Awareness Training
http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/AC%2061-67C/$FILE/AC61-67C.pdf

International Committee for Aviation Training in Extended Envelopes
http://icatee.org/

Upset Prevention & Recovery Training Association
http://uprta.org/

TOM HOFFMANN

Advanced Preflight

Take Your Preflight Inspection to the Next Level

At an airport near Tulsa, Okla., a pilot, his wife, and their infant grandchild climbed aboard a Cessna 210 *Centurion* one late August afternoon for what should have been a routine flight. The proud grandparents were flying their seven-month old granddaughter back to her home in Joplin, Miss. The scene was set for a safe flight with 10-mile visibility and light winds. But what started without incident ended quickly in tragedy.

On the day of departure the pilot was seen taxiing to the self-serve fuel pump, but no witnesses could say if the pilot had preflighted the aircraft. After topping off with fuel the pilot and his precious cargo departed for their destination. Shortly after take-off, the pilot requested an emergency landing after oil began splattering across his windshield. Another aircraft in the pattern reported seeing the aircraft in distress flying well below pattern altitude, and its pilot witnessed the plane crash and burst into flames after a one-and-a-half turn spin.

The Cessna 210's oil filler cap was found unsecured between cylinders 4 and 6.

On-scene accident investigators determined the engine was producing power at the time of impact and discovered traces of oil on the larger fragments of the windshield. Closer investigation also revealed the "smoking gun"— the oil cap hanging from its chain, wedged between two of the engine cylinders below the oil filler neck. Was this cap left unsecured by an AMT during a previous oil change? Or, did the pilot, perhaps after seeing that the level was low, add extra oil and forget to secure the filler cap? Those two questions remain unanswered.

During the engine teardown and records review of the *Centurion*, it was discovered the annual inspection had been completed five months before the accident. Also, the installed oil filter adapter was found to be out of compliance with a recurring Airworthiness Directive (AD). Further review of the records indicated that at one point the adapter had been replaced by one the AD did not affect. However, evidence suggested that following that installation, someone had replaced it with yet another adapter in which the AD was now applicable again, and then never documented its installation. For the next few years, this item was overlooked during subsequent annual inspections and oil changes by more than one AMT with Inspection Authorization (IA). Although this component was not determined to be the cause of the accident, it was believed to have contributed to an oil leak.

As you can see here, there are a few things that led up to this unfortunate loss of life. However, these red flags could have been easily discovered and mitigated with a more rigorous preflight inspection. The accident also illustrates a couple salient and yet often overlooked points for aircraft owners: Just how well do you know your aircraft, and who exactly is inspecting and maintaining it? Enhancing your relationship with both your aircraft's history and your mechanic are both critical components of an *advanced preflight*.

Advancing Towards Safety

Wait a minute! Advanced preflight? I already follow all the items on my preflight checklist. Do I have to check things differently now, or is this some new checklist I need? That's a typical reaction FAA Airworthiness Inspector Steve Keesey gets when describing the concept of an advanced preflight. While not advocating an outright replacement for your preflight checklist, Keesey does recommend stepping up your approach to a procedure that can quite possibly make the difference between a safe flight and your last flight.

"Advanced preflight is a program that helps aircraft owners and pilots become more aware of all the safety-related data pertaining to their aircraft," says Keesey. "In addition, it focuses on being more aware of who maintains your aircraft, and how to apply a detailed approach to your preflight inspection based on a review of the aircraft's maintenance history."

As evidence of its importance in helping reduce GA accidents, the FAA Safety Team (FAASTeam) has adopted "advanced preflight" as one of the three core topics of its annual Safety Standown, a nationwide event designed to raise safety awareness for pilots. While loss of control events lead the pack when it comes to GA fatalities, NTSB accident data from 2000-2009 shows poor preflight inspections caused or contributed to 156 GA accidents and 41 fatalities. No one knows how many other accidents may have been indirectly affected by an improper preflight inspection.

Referring to the *Centurion* accident, Keesey notes that an advanced preflight could have helped change the tragic outcome of that flight. "Had the pilot applied better aircraft maintenance history research techniques, he would have discovered the oil filter adapter was out of compliance and had it corrected or replaced well before the flight," he says. "A similar conclusion may have been reached if the pilot had probed a little more into the knowledge and expertise of the AMT working on his aircraft, perhaps prompting a discussion and discovery of the noncompliant part." Keesey also observes that a more thorough walk-around inspection immediately before flight could have made a big difference in this case by allowing the pilot an opportunity to realize the oil filler cap may not have been secured.

Know Your Aircraft

The backbone of any good preflight inspection begins with knowledge: knowledge of your aircraft's history, its systems and components, and its propensity for possible failures or weak spots—the sometimes inconspicuous items not always covered in an AD or Service Bulletin. A quality records review is the best way to acquire an intimate knowledge of an aircraft's maintenance history. You'll need to include all available resources: logbooks and records, maintenance manuals, ADs, manufac-

Opposite page top: During the empennage preflight, apply forward, aft, and lifting pressures to all surfaces. Inspect attaching hardware for proper installation and security.

Below: (top) Inspect the condition of the control surface structure and associated hardware. Hint: If you see a castellated nut, it should have a cotter pin securing it. If it's a self-locking nut, or one with a locking type washer, rule-of-thumb is to see at least one full thread protrude beyond the top of the securing nut.

(bottom) Checking proper operation and position of trim controls is especially important after maintenance or before each flight if you rent/borrow an aircraft. Does the trim move in the correct direction and is there any abnormal noise during operation?

Advanced Preflight Highlighted at Safety Standdown

For more information on Advanced Preflight, be sure to check out one of the many FAASTeam Safety Standdown seminars in your area this April. A list of events can be found at http://faasafety.gov/standdown/.

turer's service letters and bulletins as well as any repair and alteration history. This can take some detective work, so be sure to ask an AMT, a type club member, or even your local FAASTeam representative for help. Many of the tools to help you find what you need are conveniently available on www.FAA.gov. You can also request a complete copy of records for your aircraft by going to http://aircraft.faa.gov/e.gov/ND/.

If you're not the original owner, you'll also want to know how and where it has been stored (hangar or ramp) and what types of environments it has been exposed to (high humidity, salt-water, extreme heat, etc.). Also, ask how much and what type of flying was done (flight training, banner towing, etc.). All of these conditions affect aircraft in different ways, and many can accelerate the aging process.

Advanced preflight is a program that helps aircraft owners and pilots become more aware of all the safety-related data pertaining to their aircraft

Know Your AMT

Do you know who's maintaining your aircraft? Part of an advanced preflight is getting to know your AMT. Ask questions before a procedure or repair is done to ensure that the AMT is qualified and has the proper experience with your type of aircraft or component. You can always get a second opinion if you're not comfortable with a specific suggestion or mechanical diagnosis. Building a relationship with an AMT will not only help you learn more about your aircraft, but it may also enable you to feel more comfortable with pointing out items that you're unsure of, or believe need corrective action. Type club members are another good source of information for helping you perform a more advanced preflight. Their expertise with your particular aircraft or flying environment could prove invaluable.

Putting it All Together

Armed with a greater knowledge of your aircraft and who is maintaining it, you are now ready for the practical application of an advanced preflight: the walk-around inspection. "This inspection is likely your last chance to determine the safe operational condition before a flight," says Keesey, who recommends starting with the manufacturer's checklist if one is available. While most checklists are thorough, they won't always cover everything you need to check. Keesey advises letting a checklist form the basis of your preflight inspection, but warns not to let it set the limits of what you check. "There's no one-size-fits-all when it comes to checklists," says Keesey. "Every aircraft is unique, and so it only follows its preflight be unique too."

For example, if an aircraft's history shows a repair was made (let's say a spar splice) ensure you check the area around that repair during every preflight. Even if the item or area is not easily visible or

Left to right: 1. During the prop inspection, look for signs of erosion, pitting, and leading or trailing edge damage (nicks). If any of these items are discovered, notify an AMT for assistance in corrective action. Refer to your prop manufacturer's service manual for damage allowable limits.
2. During pitot tube inspection, look for blockage, attaching hardware, and all visible wiring, fittings, and lines.

accessible, be on the lookout for signs like buckling or cracked paint, which may indicate a problem with the part's structural integrity. The repair could also be a one-time compliance procedure, so don't rely on an AMT's workmanship to act as a lifetime warranty. Instead, keep a constant eye out for anything out of the ordinary.

Also, be aware of how vague some checklists can be. The word "check" can indicate several things so learn what it means specifically for the item you're inspecting. For instance, when checking flight control surfaces, the act of checking involves integrating and interpreting visual, aural, and tactile cues. With control surfaces, you'll want to apply movement with pressure against hinge points while looking for cracks, feeling for looseness or binding, and listening for any abnormal sounds.

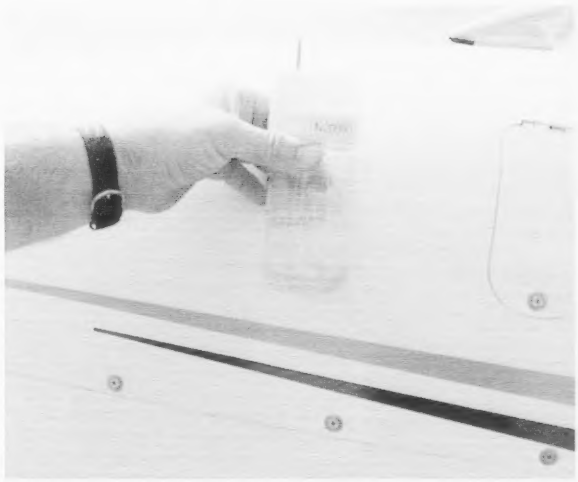
Your Preflight Toolkit

As with any job, having the right tools is always important, and that includes preflight inspections. For most aircraft, a checklist, a fuel tester and a stepladder are three of the more common tools to aid in your inspection. You may also want to grab a rag and that flashlight at the bottom of your flight bag. Besides helping your hands stay clean, a rag can also help buffer the heat of a scorching-hot oil filler cap and provide some extra leverage with a tricky latch or fastener. The flashlight provides visual access to the inner recesses of control surface assemblies and cables, not to mention the critter hideout spots under the cowling.

Another good resource to use when perfecting your preflight skills is an AMT, CFI, or another owner who knows your aircraft well. Ask them to follow you around on a preflight. They can point out things you never knew or bothered to check as well as highlight areas that are prone to aging or corrosion. One deceptive type of corrosion, called fretting, is often regarded as "that black streaky stuff" found on certain surfaces and components. Keesey points out that it is sometimes mistaken for dirt, then wiped away and disregarded—even by AMTs. For more detailed photos on this and other corrosion types, have a look at AC 43-4A, *Corrosion Control for Aircraft*.

Summing It Up

Although advanced preflight is a new concept, it is designed to enhance what you've already been doing. Given the lack of attention preflight inspections are sometimes given, as well as how many subtle factors are at play when it comes to forming a picture of complete airworthiness and flight safety, consider it a way of kick-starting a good habit and challenging yourself to look at things differently before each flight.



When checking fuel for contamination, always hold up against a contrasting object.

The advanced preflight concept also doesn't apply to just aircraft owners. "It is a valuable tool whether you own, rent or borrow an aircraft," says Keesey. "It takes some discipline and dedication, but done properly, an advanced preflight can significantly increase your chances of a safe flight."

Steve Keesey contributed to this article and is serving as a subject matter expert during the 2012 FAA Safety Standdown. He is an FAA Airworthiness Inspector and FAASTeam Program Manager in Oklahoma City, OK.

Tom Hoffmann is an editor of FAA Safety Briefing. He is a commercial pilot and holds an A&P certificate.

Learn More

Link to FAASTeam M (Maintenance) Pamphlet
www.faasafety.gov/gslac/ALC/lib_categoryview.aspx?categoryId=3

"Going Beyond Preflight," March/April 2011 FAA Safety Briefing
www.faa.gov/news/safety_briefing/2011/media/MarApr2011.pdf

Best Practices Guide to Aging GA Aircraft
www.faa.gov/aircraft/air_cert/design_approvals/small_airplanes/cos/aging_aircraft/media/aging_aircraft_best_practices.pdf

Reasons (or Excuses?)

Photos by Tom Hoffmann

(Editor's Note: FAA Safety Briefing received the following account of a conversation the authors had with a young flight instructor of their acquaintance following the 2011 FAASTeam Safety Standdown events in their location. We have withheld the name they provided, but we will tell you that the CFI in question had a grand total of 400 hours. The authors' response to each reason—or excuse—are shown in italics.)

Reason (Excuse) Number One

Listen, I'm a CFI and I had three instructional flights scheduled for that Saturday. I need those hours. I don't plan on being a CFI forever; after all, it is not a real profession or career. I want to fly for the regionals and then go on to a major airline. The more hours I can get in my logbook, the better. And if I hadn't flown with those students, another CFI would have grabbed them.

Did you know that there were five airline pilots at the standdown? They would have told you that hours are important, but demonstrating that you are committed to a culture of safety is far more important in the airline hiring process. Events like these can also be a great way to network and rub shoulders with fellow pilots and airline professionals. And yes, flight instruction can be a career. That's what the Master CFIs and Gold Seal instructors at the meeting would have told you.

Reason (Excuse) Number Two

Do you know how little I get paid as a CFI? With paying the rent for my place, for food, and the loan on my motorcycle, I've got nothing left at the end of the month. I would have to give up over 100 bucks worth of instruction to attend that FAA meeting. In addition, I can ride my motorcycle up to the glider port and try to pick up some work flying tourists. Saturday is a busy day for tourist glider rides. Sure, I would have been tired after flying all day, but there is no such thing as required crew rest for me. I can sleep when I am dead.

In the long term, that 100 bucks will fade to insignificance. If you believe that flight instruction is a step to the airlines, then use each hour you instruct to build your skills in communication, CRM and interpersonal relationships. Don't get in line at the FBO just to pick up your paycheck. It is simply not what flight instruction is all about. At the standdown we talked about fatigue and safety. You may get your chance to sleep sooner than you think.

Reason (Excuse) Number Three

Talk about boring. Those FAA meetings are just a bunch of old guys telling stories. What can I learn from them? Most of them can't even fly glass. One of those old guys hanging around the FBO once asked me, "Of all the aviation knowledge in the world, how much of it do you know?" Maybe there are one or

two things I don't know but I told him, "About 95 to 98 percent." He laughed. I wonder why. But I think that's pretty accurate since I scored an 80 percent on my CFI knowledge test and I've learned some more since then. Why waste a Saturday to add a couple of percent more knowledge?

Stories are the nails that we hang principles on. Listen to them, think and learn. Each story contains a lesson that you won't have to learn the hard way. And by the way, if you ask an older guy how much of the world's aviation knowledge he knows, he'll probably give you a very, very, very small number.

Reason (Excuse) Number Four

Let me tell you. Even if I didn't have lots to do on that Saturday, I probably wouldn't have gone to the FAA Standdown anyway. Why? I would have partied, or recovered from Friday's party, or gone to the beach with friends or worked at my part-time bartending job. Those FAA meetings are so serious. Always safety, safety, safety. I have never been in an accident. Okay, so my students have banged up a couple of airplanes, but that's not my fault. Those guys should lighten up.

Yes, you have a different set of priorities. That's OK. Just recognize that no airline is going to hire you unless you can convince the chief pilot that you are a serious professional who has the maturity necessary to accept the responsibility for the safety of your passengers. Aviation is a profession with professional standards. We would have told you about these at the FAA Standdown. And by the way—those bent airplanes are your responsibility. You are responsible for the safety culture in your student's cockpit.

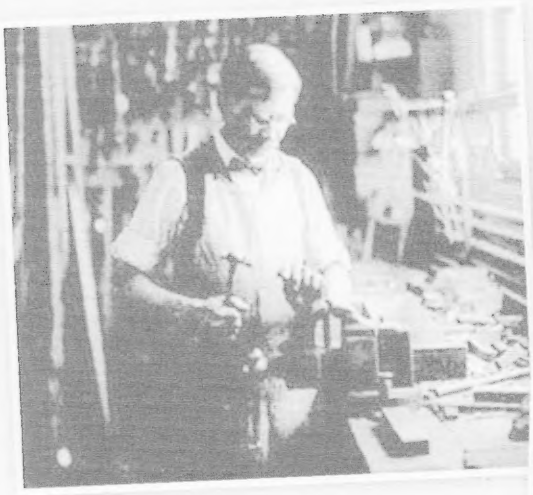
Reason (Excuse) Number Five

The last time I flew, I was so good that I don't think I could have been better. On takeoff, I was looking at the PFD and it showed a perfect six and a half degrees nose up attitude. And I held it there. I was able to do perfect steep turns at a much steeper bank that 60 degrees. My landings were right on. I put it down *before* the numbers. What can those guys at the FAA meeting tell me about technique? I can crank and bank with the best of 'em. And those old guys say some really dumb things. I was flying the *Arrow* on an early morning flight. We took off in the dark but it was light when we landed. I put the gear lever down but no three green. I promptly declared an emergency with the tower and this old guy gets on the radio in the middle of my emergency and asks if I have my nav lights on? How dumb! I landed it smooth as silk. The mechanics couldn't find anything wrong but I think all three bulbs burned out at the same time.

Whoops! We could have let you know that staring at the PFD is one of the major safety errors made by pilots flying glass. Try 70-80 percent outside, 20-30 percent inside. You may have busted a reg on that steep turn. We talked about the relationship between the regulations and safety at the standdown, along with G forces, definition of acrobatic flight, parachute requirements, stuff like that. The fixed distance markers and the VASI could have helped you make a stabilized approach and a safer landing. For short field technique, you could have listened to a story from a former Air America pilot on landing and taking off on a 50-foot runway on the top of a mountain in Laos in a Pilatus Porter. We also discussed the importance of aircraft systems knowledge. You do know about the auto-dim feature of Piper landing gear indicators, don't you?

Scott Allen, Jim Hein, and Dave Lohmann are safety-minded pilots who make it a point to attend the FAA Safety Standdown and continue adding to their aviation knowledge and skill.

FRED KAISER



(left) Charles Taylor,
(right) Wilbur and Orville Wright

Masters of Their Craft

One of the most prestigious honors in aviation today appropriately recognizes one of the greatest achievements in aviation. The Wright Brothers Master Pilot Award, named after Wilbur and Orville Wright, and the Charles Taylor Master Mechanic Award, named after Charles Taylor, the first aircraft mechanic, recognizes pilots and mechanics who have contributed to building and maintaining the safest aviation system in the world, through practicing and promoting airmanship, best maintenance practices and safe flight. Both awards recognize individuals who have held a U.S. Civil Aviation Authority (CAA—the predecessor of the FAA) or an FAA pilot or mechanic certificate for 50 or more years of civil flying or mechanic experience.

These airmen have flown safely, innovated safety techniques, advocated for safety and mentored countless numbers of pilots and mechanics.

In order to recognize the significance of this achievement, the FAA has added something new to events scheduled during the Sun 'n Fun Fly-in. Specifically, the FAA Flight Standards Service (AFS) and the FAA Safety Team (FAASTeam) will host the first annual Wright Brothers Master Pilot and Charles Taylor Master Mechanic Award at the FAASTeam's National Resource Center on the Sun 'n Fun complex. The awards presentation is scheduled for Friday, March 30, from 10:00 a.m. until 12:00 p.m.

This is an event you do not want to miss. The FAASTeam has developed an exciting and moving video presentation that takes you from the 1903 events at Kitty Hawk, North Carolina, to the introduction of our award recipients. Four pilots and four mechanics will be on hand to receive the prestigious awards as the FAASTeam presentation takes you through a snapshot of their varied careers. You will have an opportunity to review a portion of their lives, everything from the magic to the tragic, and you'll learn about the threads that contributed to their success as airmen.

While each of these individuals has a resume of achievement that differentiates them from the

others, they have at least one thing in common: A long record of safety. Whether it was orbiting the globe in space or in our own atmosphere, shuttling to the moon or to the Special Olympics, filming air-to-air scenes for Hollywood films or living the right stuff celebrated by those films, these airmen have flown safely, innovated safety techniques, advocated for safety and mentored countless numbers of pilots and mechanics.

They succeeded because their integrity resisted the temptation for shortcuts. Join us, and experience the lives these airmen lived in such a professional and exemplary manner.

Fred Kaiser is the FAA Southern Region FAASTeam Program Manager.

Learn More

For a full list of the eligibility requirements please see:
https://www.faasafety.gov/content/MasterPilot/MPA.pdf

(top) The Wright Brothers' cycle shop in Dayton, OH. (bottom) Wilbur Wright (l) greets Charles Taylor in France, 1907

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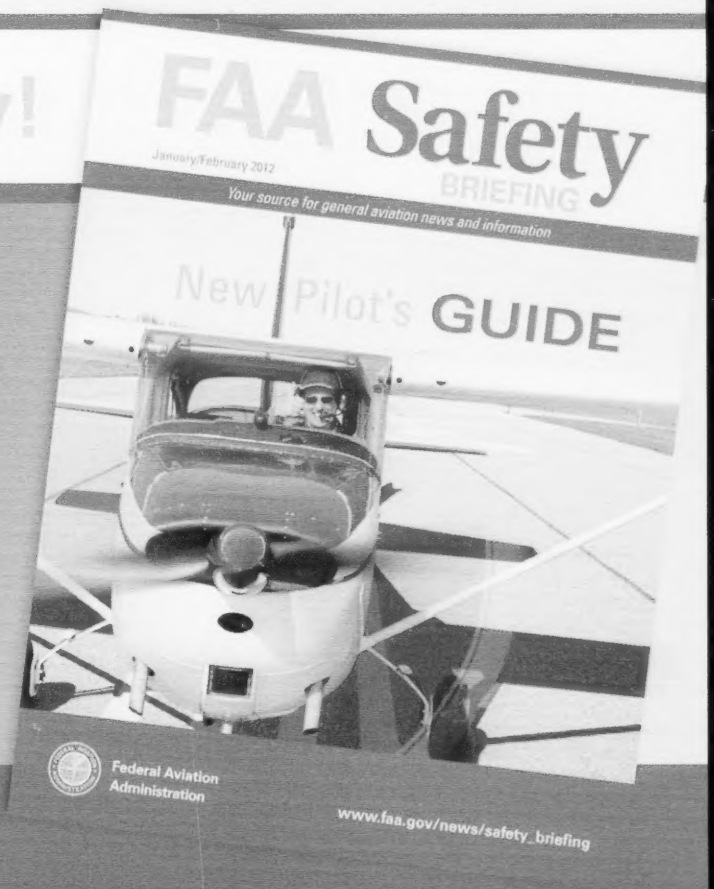


SUSAN PARSON

Checklist

Don't Get Upset!

As required by the aeronautical knowledge and practical test standards that 14 CFR part 61 sets out for the flight instructor certificate, my instructor and I strapped ourselves into a very carefully preflighted Cessna 150 one fine summer day and went forth for me to acquire proficiency in spin entries and recoveries. Although I like to think I camouflaged it pretty well at the time, I was apprehensive to say the least. The first—demonstrated—spin was terrifying. The second, with me at the controls, was easier. We finished the initial spin training session and after a couple more the following weekend, I was even enjoying them—sort of, anyway.

I met the requirement, got my spin training endorsement, and shortly thereafter passed the practical test for my flight instructor certificate. Then it was on to teaching. I was quite determined that no student of mine would ever get me even close to a spin or other loss of control-inflight (LOC-I) situation. But of course it didn't work out that way. When an early student botched his first attempt at the power-on stall recovery in a Cessna 152, I was mighty grateful that the FAA's flight instructor certification standards included experience in spin entries and recoveries. Though my inexperience let his mistake catch me by surprise, I was at least sufficiently prepared to recognize and recover well before it became a fully-developed spin.

More than the Minimum

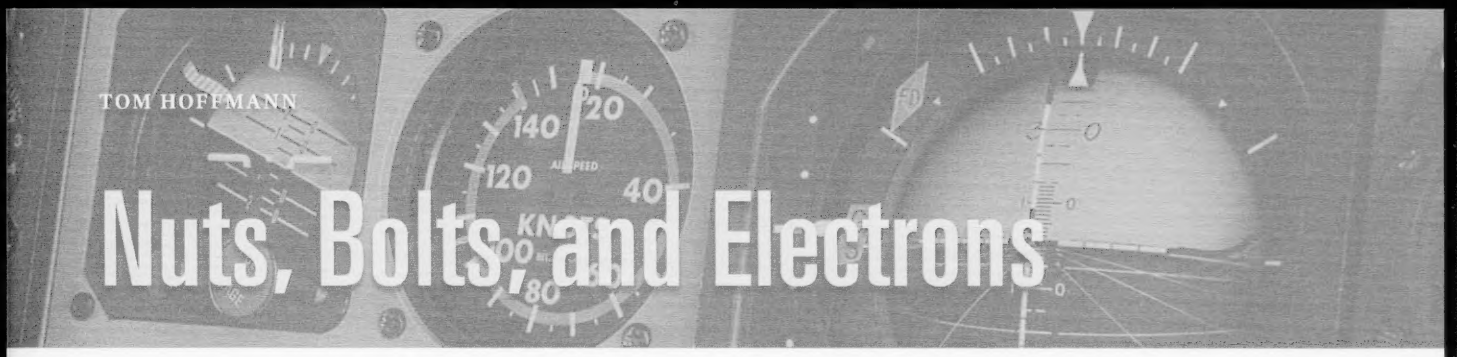
Though I had passed both the official (check ride) test and a modest real-life test with my student, my scant experience with spins and extreme unusual attitudes—the kind that lead to LOC-I—gnawed at me. And so, a few years ago, I found my way to a school that specializes in upset recovery training. The three-day course I took included intensive preflight and postflight "academics," which provided a confidence-building enhancement of my aerodynamics knowledge. But nothing created confidence more quickly than intensive hands-on flights that let me safely explore the edge of the flight envelope. For the first time, I really got the picture on how, and why, a cross-controlled skidding stall could put me in a place I didn't want to be. The school's highly trained instructors were fiendishly skilled at setting me up for "surprise" encounters with simulated, but very realistic, wake turbulence. We also had opportunities to practice coping with flight control failures. This training—all on my dime, by the way—was not cheap. By my reckoning, though, the knowledge, practice, and confidence it provided were priceless.

Several of the expert contributors to this issue of *FAA Safety Briefing* strongly encourage pilots to seek out Upset Prevention and Recovery Training (UPRT). If you're interested in pursuing this advice, you will find some very helpful information on what to look for at www.uprta.org, the website of the non-profit Upset Prevention and Recovery Training Association (UPRTA), which bills itself as "an international aviation organization devoted to flight training quality assurance and instructor pilot standardization." Managed by internationally-recognized experts in upset recovery, stall/spin recovery, and advanced training maneuvers, UPRTA provides quality assurance through certification programs for upset prevention and recovery training.

You might also be interested in checking out the website for ICATEE, which is the International Committee for Aviation Training in Extended Envelopes (www.icatee.org). ICATEE's 80 members include the main airframe manufacturers, major and regional airlines, national aviation authorities, safety boards, simulator manufacturers, providers specializing in upset recovery training, research institutions, and pilot representatives. ICATEE also provided support to the FAA/Industry Stall-Stick-Pusher Working Group, as well as the Aviation Rulemaking Committee on Stick Pusher and Adverse Weather.

What you learn about upset recovery prevention and training could truly save your life someday.

Susan Parson is a Special Assistant in the FAA's Flight Standards Service and editor of FAA Safety Briefing. *She is an active general aviation pilot and flight instructor.*



TOM HOFFMANN

Nuts, Bolts, and Electrons

The Write Stuff

Fine-tuning Your Maintenance Record Entries

After a grueling nine-hour shift, you breathe a sigh of relief while putting the finishing touches on a Cessna 182 *Skylane* annual inspection. The job was anything but routine, requiring a lengthy struggle with stripped access panel fasteners, a tricky nose wheel tire replacement, and a few ugly upholstery repairs approved by the customer. After polishing a mirror-like shine on the spinner, you glance at your watch and wince at the prospect of being late for dinner again. Knowing the customer is eager to fly the next day, and since no major repairs or alterations were needed, you quickly document the inspection as completed in the maintenance logbook and note that the aircraft can return to service. Done?

Hmm, not so fast. Despite your disdain for microwaved meatloaf, there are some additional items to consider before you close the logbook and punch out. For example (assuming you are dealing with a part 91 operator), did you double check your entry, ensuring it follows the language of the regulation found in Title 14 of the Code of Federal Regulations (14 CFR) section 43.11? How descriptive was your entry of the inspection? In this case, it sounds like it may have lacked some important details. Finally, how legible is your entry? Your personal blend of acronyms and abbreviations might make perfect sense to you, but will someone unfamiliar with what was done be able to read and understand everything?

More Is Better

"The importance of making good maintenance record entries can sometimes get lost in the shuffle of an Aviation Maintenance Technician's (AMT) daily routine," says FAA Airworthiness Inspector David Keen. "It's always good to have clear, complete and descriptive entries to ensure all the hard work you perform is properly documented and remains a vital part of that aircraft's history."

In the example above, it's possible to assume you have met all the regulatory requirements for returning the aircraft to service in an airworthy condition after an annual inspection. But let's not forget about documenting the corrective actions you also performed. While some of these actions would seem purely cosmetic, failing to document the specifics of these items can cause confusion and muddy the waters of an aircraft's maintenance history. Also, work that is not documented makes it difficult for a future AMT or repairmen to know what components or systems may have been previously affected or altered. This can have deadly consequences.

Put it in Writing

So just what does a good maintenance record entry entail? In a nutshell, the regulations require that maintenance records answer the three basic questions of what, when, and who. More specifically, they must contain a description of the work or inspection performed, the date it was completed, along with the signature, certificate number, and type of certificate held by the person approving the aircraft (or part) for return to service. Inspections require some additional information, including the aircraft's total time in service and, if the aircraft is found to be unairworthy, a list of discrepancies must also be supplied to the owner. (See 14 CFR section 43.11 for specifics)

The importance of making good maintenance record entries can sometimes get lost in the shuffle of an AMT's daily routine.

"In several instances, I've seen an invoice be a lot more descriptive than the accompanying maintenance record entry," says Keen. "That's a definite red flag." Keen advises AMTs to make logbook entries as thorough as their invoices to ensure sufficient detail.

Another area often overlooked in maintenance records upkeep is the aircraft equipment list. The equipment list is a snapshot of an aircraft's specific configuration, and it is vital to airworthiness. Alterations made to an aircraft—even minor ones—can impact, and often invalidate weight and balance information if the equipment list is not kept in sync with any changes. Even if the work performed (e.g., swapping out a radio) does not change the weight of

Did You Know...

The responsibility of proper maintenance record entries isn't just limited to AMTs and repairmen. Pilots must also follow the same requirements in 14 CFR 43.9 when performing preventive maintenance tasks.

the aircraft, the equipment list should still reflect any change that is made. This also helps maintain a more complete history of the aircraft, since some entries are only required to be retained for a specific time. And although equipment lists are not required for experimental aircraft, it's a good practice to maintain one for this category of aircraft.

A Picture is Worth a Thousand Entries

A common practice among AMTs today to show proof of their work, as well as indicate the condition of a component or part following a sign-off, is to take date-stamped photographs and include them as part of that aircraft's maintenance history. You may also want to make a copy of any photos for yourself if you suspect the item might be tampered with at a later date without a corresponding maintenance record entry.

Major Repairs and Alterations

In addition to recording inspections and routine maintenance performed on an aircraft, AMTs must also remember to document any major repairs or alterations as part of the aircraft's permanent record. Form 337 is used to record these repairs and must be filed with the aircraft's records as well as the FAA Aircraft Registration branch in Oklahoma City, OK. Keep in mind that in addition to the 337, AMTs must also make an accompanying logbook entry that references the major repair or alteration. Additional information on filling out a Form 337 is provided in Advisory Circular (AC) 43-9, *Aircraft Maintenance Records*.

Regulations require that maintenance records answer the three basic questions of what, when, and who.

Keep it Simple

To aid with your logbook entry efficiency (and perhaps prevent the onset of writer's cramp), the FAA allows maintenance record entries to refer back to data and procedures found in other documents. However, what you can reference depends on what type of work is being performed.

Minor repairs and alterations need only reference "acceptable data" such as the manufacturer's maintenance manual or information in AC 43.13 *Acceptable Methods, Techniques, and Practices—Aircraft Inspection and Repair*. Major repairs and alterations must refer to "approved data" such as ADs, Supplemental Type Certificates (STC), or FAA-approved Service Bulletins (SB). (*Note: Under certain circumstances, major repairs can reference a specific example from AC 43.13*). In either case, referencing these documents saves time and helps preserve clarity and consistency with your records.

Another useful tool in the effort to keep maintenance records more organized and complete is the use of electronic records. While their usage is growing, many electronic record systems do not meet the signature requirements in 14 CFR sections 43.9 and 91.417. Aircraft owners/operators are ultimately responsible for the airworthiness of their aircraft, which means they must also ensure any system used to track and record maintenance (electronic or written) complies with the appropriate regulations and reflects the work accurately.

The Bottom Line

The importance of entering good maintenance records cannot be emphasized enough. Besides the many safety aspects, sound record-keeping can also have a significant effect on the owner or operator's confidence in your workmanship. So the next time you've completed a job, don't let your hard work be for naught by not documenting it with a proper record entry. "Although properly documenting your actions may sometimes seem less important than the work itself," cautions Keen, "a lack of detail with records may endanger not only the operator of that aircraft, but can endanger and implicate you as well."

The meatloaf can wait.

Tom Hoffmann is an editor of FAA Safety Briefing. He is a commercial pilot and holds an A&P certificate.

Learn More

FAA Safety Briefing, March/April 2011, p. 28, "Read Any Good Logbooks?"
www.faa.gov/news/safety_briefing/2011/media/MarApr2011.pdf

AMT Handbook – FAA-H-8083-30, Chapter 12 - Publications, Forms and Records
www.faa.gov/library/manuals/aircraft/amt_handbook/

Advisory Circular (AC) 43-9, Aircraft Maintenance Records.
http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/AC%2043-9C/$FILE/AC43-9C.pdf

TOM HOFFMANN

Angle of Attack

Taking Back Control

Loss of Control Workgroup Focused on Tangible Solutions

As you may have noticed elsewhere in this issue, there is a definite focus on one of the leading causes of general aviation (GA) accidents: loss of control (LOC). In just the last decade, LOC has accounted for more than 1,100 GA accidents. That's according to a study done by the General Aviation Joint Steering Committee (GAJSC) and the Safety Assessment Team (SAT), both mechanisms for government/industry cooperation, communication and coordination on GA safety issues. Based on its findings, the GAJSC/SAT formed a special LOC workgroup dedicated to researching, analyzing—and most importantly—developing solutions for this leading culprit of accidents. And after a year of intense focus, the workgroup is beginning to see the fruit of its labor.

The International Civil Aviation Organisation (ICAO) and the Commercial Aviation Safety Team (CAST) define LOC as loss of aircraft control or a deviation from an intended flightpath while inflight. In his article "Pilot-In-Control" on page 10, author Rich Stowell further explains that LOC accidents result from situations in which the pilot should have either maintained or regained control of the aircraft, but did not. Understanding what leads to and ultimately causes the misapplication of the controls in these accidents has been the unwavering goal of the LOC workgroup from its onset.

Beginning with those LOC accidents that occurred during the approach and landing phase of flight, the LOC workgroup focused on a set of 90 fatal accidents that were selected using a customized random sampling methodology. The 90 accidents were divided equally among three categories: amateur-built, turbine, and reciprocating non-amateur-built. A mix of industry and government experts analyzed each of these accidents in detail, following the same root-cause analysis methodology used to successfully reduce the commercial accident rate in recent years—the CAST model.

"The CAST model provides us greater detail and allows us to cull more pertinent information during our analyses," says National FAASTeam Operations Lead Kevin Clover, who, along with David Oord of the Experimental Aircraft Association (EAA), is co-chair of the LOC workgroup. "From these results, we can more accurately determine the contributing factors, then establish a set of intervention strategies to mitigate the underlying problem," says Clover.

The LOC workgroup is currently working towards condensing the various intervention strategies it has developed into more specific categories, such as Aeronautical Decision Making or transitioning to a different aircraft. Using the CAST model, those strategies will then be scored on how attainable and effective they are. Once finalized, the strategies will be sent to the GAJSC as part of a report expected this June. Leveraging its organizational resources both in industry and government, the GAJSC will then decide how to begin implementing the strategies.

"Outcomes for these strategies will likely evolve into aviation technology changes and/or enhancements," says Clover. "Other strategies will focus on enhanced training and educational outreach and will involve a greater working relationship with the FAA Safety Team."

Stay tuned for more information on new GA accident mitigation strategies in future issues.

Tom Hoffmann is an editor of FAA Safety Briefing. He is a commercial pilot and holds an A&P certificate.

JAMES WILLIAMS

Vertically Speaking

One Is (Not Necessarily!) the Loneliest Number

Omnipresence is the sole preserve of divinities; the rest of us have to work as a team. But for many, if not most helicopter operators, the pilot is a team of one. While this arrangement works well enough under normal circumstances, it can leave the helicopter pilot feeling a step behind in the higher workload phases of flight.

The fixed wing community, particularly the airline world, has worked tirelessly since the 1970s to embrace the concept of Crew Resource Management (CRM). CRM keyed on dividing workload among the crew and providing a system of checks and balances on critical decisions and processes in the cockpit. But CRM also focused on the use of all available resources to improve the safety margin of the flight.

But CRM's spread to the rotor wing community has been slower since, as noted above, the second set of eyes is often not present in a helicopter. Many of the concepts utilized in CRM have been successfully applied to single-pilot operations, which have been formalized in the development of Single Pilot Resource Management (SRM). SRM is defined as the art and science of managing all the resources (both external and those on board the aircraft) available to a single pilot prior to and during flight.

Solo, But Not Alone

One of the first tenets of SRM is preparation. Begin — well before the flight — by identifying all the resources you might need during the various phases of operation. For instance, list weather reporting stations, weather reports, and checklists that could be useful and ensure that they are easily accessible in flight. This process can be as simple as locating the Automated Weather Observing System (AWOS), Flight Service, and airport frequencies on or near the planned route of flight and writing them down on a knee board. Even if you already know the route cold, this simple step can dramatically reduce heads-down time should you need the information quickly. Another tip is to tab useful sections of the flight manual or the Airport/Facility Directory. The ability to rapidly retrieve the information you need improves your situational awareness and the safety of your flight.

Another key is use of checklists. Whether you're a student pilot on the first flight or a 20,000 hour ATP, good checklist protocol is a crucial and well-established way to improve safety. When flying single-pilot in a helicopter—a machine whose control requires use of all your limbs—checklists can be more challenging. Tips: Before you launch, arrange the cockpit to allow you to quickly read the checklist hands free. You might strap it to a knee board, secure it to an open (but easily visible) area in the cockpit or, if you have a passenger, ask that person to hold it for you. A key concept to keep in mind is that single *pilot* doesn't mean single *person*; your passengers are resources, too. Just be sure you brief those passengers from whom you expect assistance before you start the rotorcraft. If you don't have assistance, don't try to divide your attention at crucial points (e.g., pre-takeoff). Stop in a safe place and take the time to ensure that the aircraft is properly configured. After all, one of the goals of checklist discipline is to ensure that the limitations of human memory and the distractions inherent to the aviation environment do not lead to dangerous or damaging mistakes.

Another helpful SRM concept is to make a mental list of response points. Adapt the concept of V1 (V1 is the speed at which a pilot must make the continue/abort decision in many fixed wing aircraft during takeoff) from the air carrier world by creating "if this, then that" decision points: If (fill-in-the-blank) happens, then I will (fill-in-the-blank), under these circumstances. This kind of mental preparation primes the proper response and removes distractions for a pilot who is operating without the support of a crew. Having already made the decision on *what* to do, you can turn your attention and energy to getting it done.

James Williams is FAA Safety Briefing*'s assistant editor and photo editor. He is also a pilot and ground instructor.*

For more information

FAA Risk Management Handbook (FAA-H-8083-2)
http://www.faa.gov/library/manuals/aviation/media/FAA-H-8083-2.pdf

Flight Forum

Tips for Pilot Retention

You requested feedback on "Flying is Not a Spectator Sport!" I agree, and applaud the focus on training. I am a private pilot and college professor, and here are some thoughts.

1. CFIs should focus on retention of students, not just acquisition. Best practices for student retention developed in higher education might apply to the training environment.
2. Students should have access to guidance/help between lessons, either by the flight school or by the school/instructor reaching out to students between lessons. This also builds a sense of caring, which helps more than most people imagine.
3. I am surprised how many students do not feel they know where they are in the instructional process. Regular assessments between major milestones (solo, check ride, written) help. A rubric already exists if you look at sample lesson plans the FAA has on the website; outcomes are clearly listed.
4. Regular assessment of instructors by students and chief instructor. A good instructor will use feedback to get better.
5. Train CFIs to teach, not just to fly. The FAA lays out the skills very well, but good teaching is gained from actual instruction by a skilled teacher and experience, not reading about it.

Len Assante

Thanks for your suggestions on retaining student pilots and improving the flight training process. Your thoughts are consistent with some of the findings and ideas arising from AOPA's Flight Training Initiative, as well as with some of FAA Flight Standards Director John Allen's vision for a U.S. Aviation Academy Program (see Jul/Aug 2011 "Jumpseat" column).

Checkride Prep

Mr. Williams' article [Know the Score: What to Know Before Your Checkride] in the 2012 Jan/Feb issue of the *FAA Safety Briefing* is right on. It should be required reading for all student pilots and flight test applicants.

J. Merola, DPE

Thanks for your feedback and we're glad you found the content useful.

Good Memories

The January/February 2012 Postflight column recalled my first flight at the age of six in a seaplane my uncle flew for an operator in Ontario. When I started aviation I did not have funds for flying but took ground school classes, which led to my passing the private, commercial and instrument written before my first flight. After many years out of the water, I was able to return about ten years ago as a DPE for SES [single engine seaplanes].

I enjoy the publication, and please pass my compliments to Lynn McCloud for the article on finding the right college. It was factual and hit the key issues.

Gary Kiteley

Thanks for your feedback. Former managing editor Lynn McCloud left the FAA and is now a speechwriter for the National Transportation Safety Board, but we will be glad to communicate your compliments on her aviation college selection tips.

FAA Safety Briefing *welcomes comments. We may edit letters for style and/or length. If we have more than one letter on a topic, we will select a representative letter to publish. Because of publishing schedule, responses may not appear for several issues. While we do not print anonymous letters, we will withhold names or send personal replies upon request. If you have a concern with an immediate FAA operational issue, contact your local Flight Standards District Office or air traffic facility. Send letters to: Editor, FAA Safety Briefing, AFS-805, 800 Independence Avenue, SW, Washington, DC 20591, or e-mail SafetyBriefing@faa.gov.*

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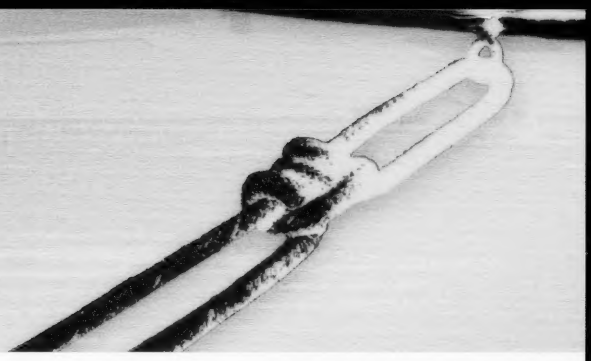
Postflight



Nothing Left to Chance

I often quip nowadays that the acquisition of an iPad has restored me to the status of Literate Human Being. Given all the work-related material stuffed into my briefcase, the perceived burden of carrying "real" books was too much and, besides, where on earth do I store them when I'm done? (Yes, I have heard of libraries ... but I like to highlight as I read.) Happily my magical electronic device allows me to carry and store eBooks—including all manner of aviation books, manuals, checklists, and guides—with no additional weight or storage penalties. It's a beautiful thing.

Association and Correlation

I tend to select my eBooks in much the same way as I surf the Internet. On the Internet, one link leads to another and I somehow slide from a review of human factors in the Canary Islands (Tenerife) crash to researching cultivation of vanilla in Madagascar (no joke—I really did that) in the space of 30-45 minutes. Similarly one eBook leads me to another, and another, and yet another. A recent reading chain took me from a book on Disney management practices to *The Experience Economy* to the memoir of a Reagan-era Secret Service agent.

Aviation in general, and general aviation in particular, have more than enough challenges without adding the enemy within.

By now you may be wondering how, if at all, my admittedly quirky reading habits relate to *FAA Safety Briefing*, loss of control (LOC), or even aviation writ large.

There is an answer.

Steeped as I am in aviation (I bleed the blue of 100LL), I somehow manage to associate and correlate almost everything to my favorite subject. As I worked with the magazine team to create, edit, and shape the individual articles and the overall package for this special Safety Standdown issue of *FAA Safety Briefing*, a number of the pieces that I read, or wrote, on LOC prevention and training brought to mind the leave-nothing-to-chance mentality and discipline described in the Secret Service agent's memoir. His business as head of the Presidential Protective Detail was one in which life and death are at stake—literally.

Our business as pilots is much the same. We hope that no one is gunning for us but, sadly, no one has to be. As accident statistics demonstrate, pilots are doing a painfully effective job of gunning for themselves. It brings to mind the comic strip character Pogo's best-known observation that "we have met the enemy...and he is *us*."

We Can Do Better

Aviation in general, and general aviation in particular, have more than enough challenges without adding the enemy within. With that in mind, the specific topics for the FAASTeam's third annual Safety Standdown were carefully selected with a view to vanquishing one of the deadliest pilot enemies, LOC-inflight. Similarly, we crafted, shaped, and sequenced the corresponding articles in this issue of *FAA Safety Briefing* to support the information provided in the Safety Standdown presentations. Our goal, as always, was to make the material relevant, timely, practical, and interesting ... even captivating.

If I could summarize a central message from this issue, though, it comes down to the idea emblazoned in the title: Leave Nothing to Chance. Knowledge is the foundation, so learn everything you can about the "academics" and aerodynamics in LOC-I. Know yourself. Know your aircraft. Know your operating environment.

Also important is skill. Go beyond what's required to pass a test, and use every flight to build and sharpen your stick-and-rudder skills. If your finances permit, consider investing in specialized upset prevention and recovery training provided by a qualified instructor. It may be the best training investment you'll ever make.

And, last but not least, be sure your attitude—the mental one as well as the aircraft version—is upright. Springtime flying beckons ... leave nothing to chance to make it a safe and happy flying season.

Susan Parson (susan.parson@faa.gov, or @avi8rix for Twitter fans) is editor of FAA Safety Briefing *and a Special Assistant in the FAA's Flight Standards Service. She is an active general aviation pilot and flight instructor.*

EMANUEL CRUZ

FAA Faces

Jose G. Rodriguez

Jose G. Rodriguez: Force of the Florida FAASTeam

R2-D2 races down the hallway. The success of the crew's mission lies on his extremely resourceful and very capable shoulders. But don't be mistaken: notwithstanding the similarity, this isn't a droid from a long time ago in a galaxy far, far, far away. R2-D2 is the very appropriate nickname of Jose G. Rodriguez, an Aviation Safety Assistant (ASA) for the FAASTeam National Resource Center (NRC) in Lakeland, Florida.

"I've always been a sci-fi geek," says Rodriguez, who earned his nickname from both his interest in Star Wars® and his wide-ranging abilities. "R2 always has the right tools for every situation. He's a small droid, but he actually makes a big difference."

There's certainly nothing small about the impact Rodriguez has in his office. "It's tough to quantify how much R2 does for the FAASTeam," says Kieran O'Farrell, Frontline Manager at the NRC. "Jose's uncanny instincts always put him a step ahead of everyone else. Just like R2-D2, he knows how to do almost anything we need."

The "how" has always been of interest to Rodriguez, especially when it comes to aviation. In 2003, he joined the Air National Guard as an Air Transportation Journeyman. Although he had friends in other career fields, he valued the focus on logistics. "I liked actually planning the load. I liked figuring out the logistics."

While still with the Air National Guard on a part-time basis, he joined the Transportation Security Administration (TSA) and enrolled in Embry-Riddle Aeronautical University in 2006. "TSA was a stepping stone for me," he explains. "I like dealing with people, and I wanted to be more proactive." His opportunity came when he learned about his current ASA position. "I had thought about working with a Flight Standards District Office (FSDO), but this opportunity at the NRC was even better," Rodriguez says. "It's more about education and it gives me a chance to be creative."

His roles with the NRC certainly vary. Rodriguez handles administrative support and facility management, but it's working with the FAASTeam outreach that he values above all. Whether it's the Master Pilot or Mechanic Awards, aviation safety DVDs, or preparing brochures, he's likely to have had a hand in some aspect of it. If you've been to Sun 'n Fun in the last couple of years, you may very well have seen his handiwork.

"We begin preparing for Sun 'n Fun in September; six months before the actual event," explains Rodriguez. "There are so many aspects that need to be coordinated. It ranges from preparing the forum schedule and coordinating the speakers, to booking the facility and ordering supplies. Preparing for Sun 'n Fun is certainly demanding." But the outcome is worth it for Rodriguez.

"It is mentally and physically stressing, but when day one of the event starts, it's gratifying," observes Rodriguez. And this year will be no different. With 27 forums—seven more than normal—and a multitude of exhibits, Sun 'n Fun promises to be an event worth visiting. "You'll also see a first-time exhibit for the NTSB, which will also offer four seminars," adds Rodriguez. Also on the schedule is a Town Hall with Congressman Sam Graves, and the 3rd Annual FAASTeam Safety Stand down.

As Rodriguez notes, "Every year of Sun 'n Fun is a unique experience." So if you have the chance between March 27 thru April 1, Lakeland is the place to be. And if you see Jose G. Rodriguez (aka R2-D2), give a wave or a handshake to someone who had a hand in making the event possible.

Emanuel Cruz is a Management and Program Analyst with the Flight Standards General Aviation and Commercial Division.

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